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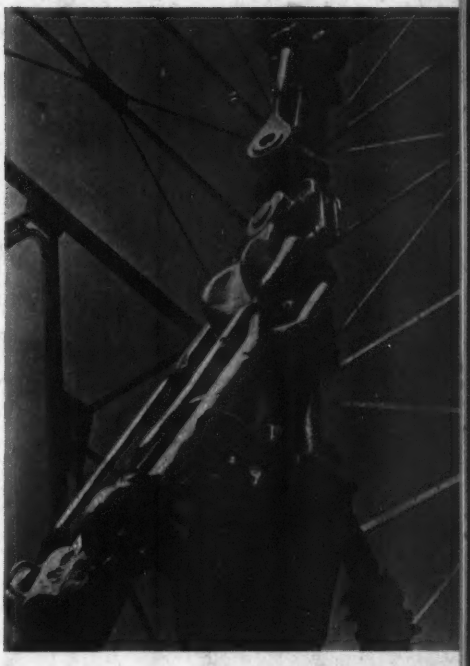

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CALIFORNIA
OIL WORLD
and Petroleum Industry

THE AUTHORITY ON THE CALIFORNIA OIL INDUSTRY

NOVEMBER 5, 1937
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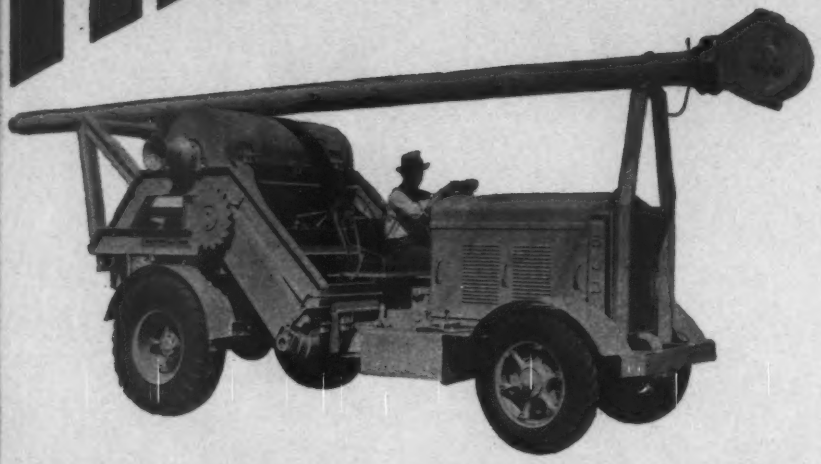

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CALIFORNIA
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A Human Life

The most important move that the Oil Producers Agency has taken since its inception during the dark days of the depression was taken last week when the directors of the Agency determined upon action which ultimately will lead to the formation of a "department of safety" for the independent branch of the California oil industry.

As at present planned, a safety program for the independents as a group will be developed. This program will involve the hiring of a safety engineer and such assistants as he will require, the formulation of safe practices, the creation of safety education for the men who are employed by smaller units that do not have safety departments or programs, and such other requisites to complete a safety program as are necessary, the whole to be actively and cooperatively supported by managements of the independent companies.

The program is based upon a three-fold foundation. The humanitarian element of saving a life, or preventing injury—comes first; enhancement of good labor relations comes second; and the economic gain to be had through lowered compensation insurance rates comes third. Incidentally, experience in the Mid-Continent, where just such activity was undertaken by the independents in 1928 and has continued and is continuing to date, indicates beyond all doubt that safety measures more than pay for themselves in all three respects.

While it is frequently said that the interests of the majors are at odds with those of the independents, here is a golden opportunity to prove that each is dependent upon the other. The major companies in California have the experience of long years of safety work; nothing could be more appropriate than that the majors make this experience available to the independents. We believe that they will do so. We believe that when a human life is in the balance, surface differences will disappear and the underlying theme of cooperation will come definitely and effectively out in the open.

THE OIL COMPANY SERIES

Due to unforseen difficulties in the historical research necessary to a complete story of the development of The Texas Co. of California, which is to be the next company taken up in the California Oil World series of histories of California oil companies, the publishers are forced to postpone the first article of The Texas Co. history to the issue of Nov. 20, after which it will continue until completion.

Independents Launch Safety Program For Smaller Units

Formation of cooperative safety department for all independents undertaken; will make safety education and knowledge of safe practices available to entire industry.

With the inauguration of a safety program for the smaller companies of the industry, the campaign to be undertaken as a cooperative effort by the Oil Producers Agency, the group has taken one of the most far-reaching steps yet made by the independents of the industry.

Present plans call for the formation of a safety division for independent companies, under a director who will devote his entire time to educating and instructing both men and managers of the independent companies in safety principles. This division will act as a clearinghouse for all safety information, and will in addition take positive steps to create safe conditions for oil field workers.

The campaign was launched at a luncheon meeting of the directors of the Agency, recently held at the Biltmore Hotel, at which C. H. Fry, chief of the State Bureau of Industrial Accident Prevention, A. A. Morey, Mid-Continent safety engineer, and Melville Dozier, Jr., director of the Agency, who has had considerable experience in safety work, told of various phases of safety efforts on the part of industry in general. Mr. Morey's talk explained the move as it has been carried out since 1928 in the Mid-Continent, where smaller operators have been active in a cooperative safety bureau such as the one proposed for California independents. Mr. Morey was positive in his declaration that the move not only paid dividends from a humanitarian standpoint, but also quoted actual figures to show that it paid cash dividends in the form of lower insurance rates.

A safety committee of the Agency, appointed recently to study the matter, under the chairmanship of Frank Travers, presented its report, strongly recommending that the matter be pursued. The report follows.

Committee Report

We believe that there exists a definite need for safety education among independent oil producers for three reasons. (1) Humanitarian: There is an opportunity for relief of human suffering through close application to an intelligent safety education program. No industry can afford to overlook its simple duty to humanity. (2) Labor: Better labor relations may result from more attention to eliminating hazards of oil field employment. Positive labor aids in the way of safety devices, and other protective work, even though simply educational, should result in happier employees and thus improved labor relations. (3) Economics: The increasing cost of workmen's compensation insurance threatens the financial security of the independent oil industry. Through reduction of accidents these costs may be brought down to bearable limits.

The reasons for the present condition of high accident frequency and thus high insurance costs may lie in the facts disclosed by answers to a recent questionnaire sent to a representative group of independent oil operators by this committee. Of the first 100 companies reporting, only five had safety engineers, and not all these were full time. The payroll represented by one group of companies without any safety engineering of their own was in excess of $10,000,000 a year, which provides a gauge of the neglect of safety education in the independent oil industry of California. It is true that several of the companies were using a type of safety education, such as posters, either supplied by the insurance carriers or other miscellaneous sources, but, in the main, the committee found, with but one or two outstanding exceptions, very little safety education work of the type necessary to bring good results in the independent industry.

From admissions made by the compensation insurance carriers, the expenditure of the allocated 2½c portion of the premium dollar in safety work, among independents, even in those few cases where any is spent, does not accomplish any substantial results. The reason given for this situation by the carriers is that the efforts of the safety engineers of the insurance companies have not received the positive support of oil company executives. The committee suggests that unfamiliarity with oil field practice, plus absence of concerted effort by the insurance carrier safety engineers as a group, may also account for what appears evident; the failure of the insurance companies adequately to aid the independent oil industry in reducing its accident frequency.

Accident Costs Increase

With the lack of safety education by oil companies, and the lack of cooperation on safety by insurance carriers, the committee can see no other prospect for the independent oil producer of California than even greater increases in accident costs. It offers as a solution to this problem, an industry-wide safety education program. It suggests consideration of this program for humanitarian, labor, and economic reasons, and wishes to point out the conspicuous success of major oil companies in reducing their accident costs by similar safety programs.

We cannot too strongly recommend that any action taken be industry-wide in scope, for the very evident reason that only in unity is strength and only through **all** cooperating can aid be given to **each**. We believe that in educating all workers in the oil industry under one safety program that the job can be done more rapidly and for less money. Likewise, in attempting to reduce costs and insurance rates, collective action will accomplish results that individual effort will not.

We recommend that the industry-wide effort be under the direction of a strong committee of oil operators; that this committee be of appropriate size; that the committee have the active support of the executive heads of every independent oil company in California; and that a chief safety executive be appointed whose duties would be to enlist the support of all senior executives, and, with the aid of a suitable staff, to marshall and coordinate the work of all junior executives, in charge of safety, of all independent producers; to marshall and coordinate the work of all oil company safety engineers, field superintend-

ents and foremen, and to assist in the education of the workers.

We recommend that the chief safety executive also enlist the aid of all safety engineers of insurance companies interested in the oil industry compensation business in order that the safety work done by these engineers shall be concerted and shall augment the work to be done by the industry itself. The committee believes it possible to consolidate the sporadic efforts of the several insurance carriers under a definite plan. This should bring about expenditure of the 2½c paid to the insurance companies in each premium dollar for safety work, in a way better calculated to reduce the industry's accident frequency.

Financing

The safety education program should be financed by all units of the industry desiring to contribute, with the funds kept in a special account, subject to control of the industry's safety committee. The financing should be based on the gross compensation insurance premium payments of contributing units, with a reasonable maximum annual contribution by any one company.

The best estimates available indicate that the safety education program cannot be carried on successfully for less than $20,000 annually. This is less than 2% of the independent oil industry's gross annual compensation premium. The costs of subsequent years may be less than that sum. But, an improvement in industry morale, a reduction in the basic rate and the individual experience rate of workmen's compensation insurance, the uniform education of all employees, and the satisfaction of sharing in a humanitarian movement should justify independent oil producers in now assuming the burden of such a safety program and thus effect an economy far in excess of the cost. That the proposed program is economical is best judged by comparison with the budget of a major oil company safety program. This company spends one-third of 1% of the annual payroll for safety education. Were any 100 independents with a combined annual payroll of over $10,000,000 to use the same percentage as the major company, in excess of $33,000 would be spent for safety by this group. The committee, however, believes $20,000 annually will be adeqaute for the entire independent industry.

Until the safety minded units of the oil industry have had time to fully consider the plan, the committee suggests that the urgency of prompt action dictate immediate sponsorship of the movement.

Union Evaporator Tower Makes Safe Journey

Loading the 93-foot, 151-ton evaporator tower for Union Oil Co.'s new $2,000,000 cracking plant at Oleum aboard a barge at Long Beach Harbor. To get the huge vessel aboard, it was necessary to remove the barge's engines and deckhouse.

The largest piece of freight ever shipped west, a titanic evaporator tower for the $2,000,000 cracking plant Union Oil Co. is building at its Oleum, Calif., refinery, has just arrived safely at its destination on the eastern shore of San Pablo Bay after a land and water journey of thousands of miles.

The tower is 93 ft. long, 12 ft., 10 in. in diameter, weighs 151 tons and is valued at $75,000. It consists of two steel units, a lining of high chrome steel welded on to an outer shell of regular steel. It was insured by three companies during its journey, as no one company wanted to assume the full risk for the hazards involved in its transportation to the Pacific Coast from Milwaukee, where it was fabricated.

This evaporator tower is so large that it required three special flat cars to carry it on its rail journey, including the only two flat cars made that are capable of carrying 200 tons each. It couldn't be shipped all the way by rail as it is too long to negotiate tunnels. No barge big enough could be found to take it from Milwaukee through the Great Lakes and the Erie Canal to an ocean steamship at New York. Shipping it by rail to New Orleans and thence by steamer was ruled out by fear of hurricanes. Finally, it was routed on two rail lines to Los Angeles for transhipment to Oleum. It took a month and a day for the vessel, traveling only by daylight, to reach Los Angeles.

Officials planned to transport the 151-ton tower to Oleum on the world's largest highway trailer, a 34-wheel job drawn by a 200-horsepower Diesel tractor, but the state highway department refused to let this much weight traverse highway bridges. So it was decided to move the vessel to the harbor and take it to Oleum by boat.

At Los Angeles Harbor, more difficulties arose. No crane could lift the huge mass of steel and the weight was held too great for the piers there. So the vessel was transferred to Long Beach and gently rolled off its flat cars over a skidway of huge timbers onto the only barge capable of handling it. This barge had to have its deckhouse removed to accommodate the evaporator and when the load hit its deck, the barge settled 30 inches in the water, twice as much as anticipated. It was the largest single towing job in the history of the port.

White Promoted By Seaside Oil

Derek White, advertising manager of the Seaside Oil Co., was recently appointed sales promotion manager for the company. He will continue to be responsible for all advertising activities.

White, who became advertising manager for Seaside a year ago, had prior to that been copy chief for the Hanff Metzger Advertising Agency, who handle all Texaco advertising in the 11 western states.

Contributions Of Industrial Research Topic At A. P. I.

Eighteenth annual meeting at Chicago Nov. 8-12 to have Chas. F. Kettering as principal speaker, with election of directors, usual group meetings also on program.

Contributions of industrial research to the economic welfare of the United States will be the featured subject of discussion at the 18th annual meeting of the A.P.I., Nov. 8 to 12, in the Stevens Hotel at Chicago.

Advance reservations indicate that more than 2000 oil men from all sections of the United States, and from several foreign countries, will hear addresses by Charles F. Kettering, of Detroit, Mich., vice president and director of research for General Motors Corp., and Dr. H. E. Howe, of Washington, D. C., editor of "Industrial and Engineering Chemistry." The third guest speaker will be Congressman Wesley E. Disney, of Washington, Representative from Oklahoma.

The program for the 1937 meeting calls for an additional day to be devoted to committee meetings, of which more than 60 are scheduled. Monday and Tuesday, Nov. 8 and 9, will be given over entirely to committee meetings, with the first general session to be held Wednesday afternoon, Nov. 10. Dr. Howe will address the first general session on "The Significance of Petroleum Research—Its Value to the Public, Its Necessity to the Industry." The annual "President's Address" will be delivered by Axtell J. Byles, of New York. The third speaker will be J. D. Collett, of O'Keefe & Collett, Fort Worth, Texas, a member of the board of directors.

The second general session is scheduled for Thursday afternoon, Nov. 11, with Mr. Kettering, Congressman Disney, and George A. Hill, Jr., institute vice president for production and member of the board of directors, as speakers. The annual dinner, with program of entertainment, will be held Thursday night.

Elections

The terms of office of nine officers, 51 directors, and 75 members of divisional general committees expire at this meeting. The positions will be filled by election and appointment. The Board of Councillors will meet Wednesday morning, Nov. 10, to nominate candidates for election to the board of directors. The election will take place at the Wednesday afternoon general session, at which time also awards will be made to various companies for outstanding work in accident prevention during the past year.

A special group session, sponsored by the Institute's Central Committee on Automotive Transportation, will be held Wednesday evening, Nov. 10, for the presentation and discussion of technical papers on motor truck tanks.

The first group session of the Division of Production, scheduled for Thursday morning, Nov. 11, will be sponsored by the Central Committee on Drilling and Production Practice, with B. B. Wescott, of Gulf Research and Development Co., Pittsburgh, Pa., presiding. Technical papers now being considered for presentation and discussion concern well-depth measurements, circumferential welding of casing, relationship between design and heat treatment, and comparison of steam and electricity for use in drilling oil wells.

Dr. K. G. Mackenzie, of The Texas Co., New York, will preside at the first group session of the Division of Refining, also to be held Thursday morning. Dr. Frederick D. Rossini, institute research associate at the National Bureau of Standards, Washington, D. C., will present a review of a decade of cooperative research on the chemical constituents of petroleum conducted by the institute and the Bureau. R. T. Goodwin, of Shell Union Oil Corp., New York, will discuss fuel oil production and use, with emphasis upon future outlook for supply in the United States. The influence of fuel characteristics upon high-speed diesel engine performance will be considered in a paper prepared for presentation by G. A. Hope and W. S. Mount, of Socony-Vacuum Oil Co., Inc., New York.

Problems related to oil production practices will be considered at the second group session of the Division of Production, scheduled for Friday morning, with W. E. Gilbert, of Shell Oil Co., Los Angeles, Calif., presiding. Technical papers now being considered for presentation concern such subjects as factors controlling the bridging of sand in slot openings, gas-oil ratio control, and gas engine maintenance. Twenty members of the Division of Production General Committee will be elected.

The Division of Refining's second group session, also to be held Friday morning, will be devoted to a discussion of iso-octane, with J. B. Rather, of Socony-Vacuum Oil Co., Inc., New York, presiding. The manufacture of motor fuels by the polymerization process will be considered in a paper prepared for presentation by Gustav Egloff, J. C. Morrell, and E. F. Nelson, of Universal Oil Products Co., Chicago, Ill. "The Catalytic Polymerization of Butylenes by Sulfuric Acid" will be discussed by E. H. McAllister, of Shell Development Co., San Francisco, Calif. S. D. Heron, of Ethyl Gasoline Corp., Chicago, will present a paper on experiences with aircraft operation on the new fuels of 100 and higher octane number. At this meeting the division will elect 20 members of its general committee.

The Friday afternoon group session of the Division of Production, with H. H. Power, of The University of Texas, Austin, Texas, presiding, will consider the general subject of production practice and research. Technical papers considered for presentation and discussion include emulsion prevention, well-performance terminology, and significant aspects of the research program under the Institute's Research Project No. 4 dealing with origin and environment of source sediments of petroleum.

Developments in the field of motor fuels will be reviewed at the closing group session of the Division of Refining Friday afternoon. T. G. Delbridge, of The Atlantic Refining Co., Philadelphia, Pa., will preside. Technical papers concerning the fuel systems of 1937 motor vehicles will be presented by T. W. Legatski and R. R. Couch, of Phillips Petroleum Co., Tulsa, Okla., and concerning the effect of altitude on anti-knock requirements by Neil MacCoull, K. L. Hollister, and R. C. Crone, of The Texas Co., New York. Reports of road and laboratory knock tests will be discussed.

California directors whose terms of office are expiring are: S. Belither, Shell Oil Co.; W. C. McDuffie; R. D. Mathews, Union Oil; H. D. Collier, Standard Oil; T. A. O'Donnell.

Royalty Agreement With Standard Justified By Facts

Company makes more concessions to state than any other operators in area. Royalty basis same, and subject to revisions in event of judicial determination of different boundary line.

"By the consummation of this agreement, all operators at Huntington Beach have been given like consideration **except for the specific concessions made by Standard Oil Co. of California** as hereinbefore mentioned."

The paragraph above is a quotation from a letter from Arlin E. Stockburger, State Director of Finance, to Governor Frank F. Merriam, containing the further information that the state had, pursuant to the agreement accepted a payment of $518,628.04 from the Standard as royalty payment from six wells at Huntington Beach, of which wells surveys had determined that three were producing 100% from state owned lands, and three were averaging 50% production from state owned lands.

The concessions mentioned are: (1) The state can cancel Easement No. 338 (which is the agreement referred to) at any time, whereupon Standard will cease producing the six wells in question; (2) adjustment of the agreement will be made if judicial decisions determine that the boundary line of the easement, now based upon the Leeds survey, shall be changed; (3) Standard agrees to meet any royalty paid under any other set of circumstances by other operators in the area.

That the state has got additional concessions from the Standard; that the company has made every effort to cooperate with the state; that the settlement would have been made months ago were it not for a request for delay by Senator Culbert Olson; that there are 88 deliberately slant-drilled wells in the area besides the six unintentionally slanted wells of the Standard; that the settlement was based upon Senator Olson's investigating committee recommendation as well as a recommendation by an Assembly committee; that both the Senate and the Assembly approved the settlement—all these facts are conveniently overlooked by Senator Olson in his recent statement thet the settlement robs the state of $5,000,000.

No Justification for Figure

In the first place, there is no justification for the figure of $5,000,000. It represents the total amount of oil taken from the lease since production was started, and there is no justification for the state's confiscation of this oil or the revenue derived from it. The $500,000 figure, which the state accepted as royalty payment, represents the total cumulative royalty, on the same basis as royalties are being paid by other operators in the area, from the six wells admittedly producing all or part of their oil from state-owned property. That this figure, or at least that this method of arriving at a figure is fair, can hardly be controverted.

The only criticism of the settlement thus far has come from Senator Olson, and has been seconded by Nathan Newby. The latter is an attorney in Los Angeles, who has made many assertions that the settlement is an outright steal by the Standard Oil Co. of the same amount of money—$5,000,000—as Senator Olson contends, by methods known to him alone, could have been recovered from the company by the state.

Another feature of the case is the fact that the other operators in the area, who have 88 wells bottomed in the state-owned lands, deliberately drilled into these lands, and subsequently admitted that they had deliberately drilled into the lands and agreed with the state upon a royalty schedule. In the case of the Standard, which has 16 wells on the lease in question, not one well was deliberately drilled under the ocean.

Voluntary Survey

However, when the question of the location of the bottoms of the 16 Standard wells came up as a result of the state action against other Huntington Beach operators, the Standard offered to survey its wells, using the services and methods of an independent surveyor agreeable both to the company and the state, and based its royalty offering strictly upon the findings of this surveyor. Incidentally, the procedure was exactly the same as that for operators of the other 88 tideland wells in the area.

When the settlement was made between the state and the other operators in the area, it also would have been made with the Standard except for the specific request of Senator Olson that settlement be delayed until he and a Senate committee could investigate the matter. These investigations were held during part of 1934, 1935 and 1936, and the early part of 1937, with the committee finally reporting, on Mar. 27 of this year, that the agreement, subject to the specific provisions mentioned above, be consummated.

That his own committee recommended the acceptance of the agreement is another pertinent factor overlooked and carefully not stated by Senator Olson in his attacks upon the settlement with Standard. Publicity in the daily papers, emanating from both Mr. Olson and Mr. Newby, not only does not mention this point, but it also hides the methods of reasoning by which they have arrived at the conclusion that the state has been cheated out of $5,000,000.

Oil Stocks Increase In September; Demand Drops

Daily production 685,184 bbls., with indicated daily demand 666,860 bbls., according to A. P. I. Bureau of Mines shows 711,639-bbl. demand.

Oil was added to storage in California in September, according to the A.P.I., for the first time in months. The total addition was 549,781 bbls., bringing stocks to 121,773,865 bbls. at the end of the month, and a great portion of the September increase was in gasoline stocks, as can be seen by a reference to the tables elsewhere in this issue.

With production at 685,184 bbls. daily, totaling 20,555,578 bbls. for the month, indicated demand was 666,860 bbls. per day, or 20,005,797 bbls. for the month. This indicated demand was a decrease of 2,884,536 bbls., or 71,538 daily, as compared with the figures for August. For the latter month, indicated demand was 738,398 bbls. per day, for a total of 22,890,333 bbls. Production for August was 673,422 bbls. per day, 11,762 less than during September.

As is usual, however, the Bureau of Mines statistics do not agree with those of the A.P.I. The Bureau indicates a demand for 711,639 bbls. per day, which is 44,779 bbls. daily more than the A.P.I. figures show. The Bureau also differs in its report of additions to storage, showing a total of 280,090 for the month as compared with the A.P.I. total of 549,781. The discrepancy for August was 32,601 bbls. daily, the Bureau showing that much more demand in that month than the A.P.I. The Bureau's demand totaled 771,000 bbls. per day during August, 59,361 bbls. daily more than its September demand.

In spite of the apparent declining trend of demand, to be expected with the onset of the winter season, the U. S. Bureau of Mines has recommended a further increase in the allowable production for November, setting the production level for this month at 674,600 bbls. per day, as compared with 660,000 for October, and compared with an even lower figure for September.

Field activity remained at practically the same levels in September as in August, increases in one category being offset by decreases in others. September saw the erection of 145 new rigs, against 108 in August; 248 drilling wells against 247; 100 completions against 103; 75,920 bbls. daily initial against 37,966; 13,245 wells on production against 13,074; 37 abandonments against 51. Average initial production of the 99 oil wells completed during the month was 765.86 bbls. daily, the exceptionally high figure being due to two Belridge, one Greeley and one 10 Sections wells, each of which averaged from 3300 to 3500 per day, together with five 2000-bbl. El Segundo and two Kettleman wells whose average was nearly 1700 bbls. per day. Daily average initial from the 102 oil wells completed during August as 372.22 bbls., less than half the average of new September wells.

Los Angeles Basin

Los Angeles Basin production totaled 9,582,969 bbls. during September, a daily average of 319,442 bbls. from 20 listed fields. Total production declined 66,823 bbls. from the August figure, but, because September had one less day than August, the September daily average was 8194 bbls. more than that of August. Daily average during September, 1936, was 254,960 bbls., the year's increase being 64,482 bbls. per day. Of the increase, by far the greater portion came from one field, Wilmington, with El Segundo the next biggest contributor.

There were 44 completions in the basin during the month, their total initial being 39,815 bbls., an average of 904.88 bbls. per well per day. This average was due in great part to five excellent completions at El Segundo, which averaged in excess of 2000 bbls. each, and to Wilmington's 938.63-bbl. average from 27 completions. In the preceding month, 59 completions totaled 21,648 bbls. for an average of 366.91 per well.

New rigs erected totaled 38 in September against 43 in August; there were 73 active drilling wells against 74; 5312 actively producing against 5251. Average production from all wells in the basin during September was 60.14 bbls. per day, a slight increase over the per well average of 59.28 bbls. during August.

San Joaquin Valley

Daily average production for the Valley was 294,456 bbls. during September, making a total of 8,830,700 bbls. for the month. The total for August was 8,960,922 bbls., the daily average being 289,062 bbls. As in the case of the basin, total production for the month decreased, but the daily average was higher, the drop in the former being 130,222 bbls. while the increase in the latter was 5294 bbls. In September, 1936, daily average production in the valley was 262,994 bbls., the increase for the year being 31,362 bbls.

The 43 new wells completed during the month had a total initial of 28,682 bbls. per day, an average of 667 bbls. per well. The average was brought up over the former month's figure of 372.56 bbls. per well from 32 completions by big completions at North Belridge, Greeley, Kettleman and 10 Sections.

There were 64 new rigs erected in the 18 listed fields of the Valley, against 40 in August; 78 active drilling wells against 77; 6631 on production against 6556.

Average production from all wells in the valley was 44.39 bbls. per day per well during September, as against 44.58 bbls. per well during August.

Coastal District

Total production of 2,141,909 bbls. was registered by the 10 Coastal fields during September, the daily average being 71,396 bbls. In August, the total was 2,265,364 bbls. and the daily average 73,077 bbls. On the coast, therefore, both total production and daily average production dropped, the former by 123,455 bbls. and the latter by 1681 bbls. In September, 1936, daily production averaged 61,216 bbls., the year's increase being 10,180 bbls., most of it being credited to Santa Maria.

There were 12 completions during the month, their total initial being 7423 bbls., an average of 618.58 per well. Of the 12 completions, eight were in the new Santa Maria area, their initial average being 1144 bbls. During August, 11 completions averaged 399.64 bbls.

Santa Maria also showed eight out of the 12 new rigs erected in the Coastal area during the month, the total for the former month being 14; there were 51 wells actively drilling against 47; 1288 wells were on production against 1254. Average production from all Coast producers during September was 55.43 bbls. per well per day, against 58.27 during August.

Wildcats and Gas Fields

Fourteen rigs were erected for new wildcats during the month, as compared with nine during August, with 42 actively drilling and 13 abandoned, against 48 drilling and 13 abandonments during August.

Rio Vista scored the only completion in gas fields of the state, while two new rigs were erected, four wells were drilling and 14 strictly gas wells were on production.

Special Session To Interest Oil Industry

The special congressional session, called by the president for November, will probably consider some legislation of interest to the oil industry. Among this material is the wage and hour bill (which will probably be amended considerably by Administration forces), the stream pollution bill, and the bill authorizing Federal control of natural gas that enters interstate commerce.

State Labor Relations Board Petition To Be Studied

The initiative petition recently titled by State Attorney General U. S. Webb providing for a state labor relations board to arbitrate labor disputes will not be actively pushed for signatures until an opportunity has been given to a number of trade associations to study the measure. The proposed board, to be appointed by the Governor, would be authorized to set up tribunals to hear individual disputes. Such tribunals would be composed of three members each, one representing the employer and one the employees. The third member would be chosen by joint action. A copy of the petition may be studied at the office of the California Oil and Gas Association.

Save yourself a HOLE Lot of trouble with

A NEW CORE ORIENTATION SERVICE

Sperry-Sun's Polar Core Orientation (U. S. Patents 1,792,639, 1,778,981, 2,089,216 and others pending) does not interfere with the progress of drilling. The orientation is determined in our laboratory, to which the selected cores taken by any type of core barrel in the ordinary course of drilling and properly marked, are shipped from any distances. No special equipment is required at the well, there is no loss of drilling time.

SURWEL SERVICE

Given at reasonable rates by our specially trained staff equipped with special trucks. TWO SURVEYS ARE MADE FOR THE PRICE OF ONE PROVIDING A DOUBLE CHECK. SERVICE IS AUTOMATIC AND VERY SPEEDY. Open holes are surveyed by attaching the SURWEL Clinograph to the drill stem and making a round trip with it as fast as the drill crew can make it, with no waiting for orienting the pipe.

Cased holes are surveyed by making a round trip on the wire line at an average speed of 180′ per minute.

TIME required FOR making TWO SURVEYS, one in one out, OF a 6000′ HOLE on the WIRE LINE about TWO HOURS, on the DRILL PIPE about FOUR HOURS.

SURWEL surveys are of great value when:

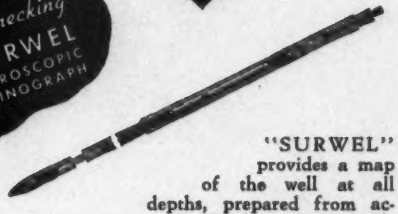
- Solving production problems
- Deepening old holes
- Experiencing difficulties with pumping equipment
- Water infiltrations
- Drilling wells near border lines

and if made when these problems arise will help in solving them at a great saving in cost.

Self Checking H-K Clinograph

"H-K" deigned for open holes only—provides permanent, accurate, photographic records of inclination and direction on paper discs five minutes after removing instruments from hole. (U. S. Patents 1,812,994; 2,027,642; 2,093,128 and others pending.)

Self Checking SURWEL GYROSCOPIC CLINOGRAPH



"SURWEL" provides a map of the well at all depths, prepared from actual photographic records, made while going in and coming out. (U. S. Patents 1,124,068; 1,812,994; 1,898,473; 1,959,141; 1,960,038; 2,006,556; 2,012,138; 2,012,152; 2,012,455; 2,012,456 and others pending.)

Self Checking SYFO Clinograph

"SYFO"—used on a wire line, as a "Go-Devil" inside the drill stem, or on sand or bailing line in open hole—affords quick, inexpensive daily records of vertical deviation in drilling, without the use of dangerous acids. (U. S. Patents 1,962,634; 2,013,875 and others pending.)

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1608 Walnut Street, Philadelphia, Pa.

Tulsa, Oklahoma, 425 Petroleum Bldg. Houston, Texas, 3118 Blodgett Avenue. Long Beach, Calif., 549 E. Bixby Rd. (3800 Block—Atlantic Ave.)

Lafayette, La., Bank of Lafayette Bldg. Bakersfield, Calif., % Elks Club, 17th and I Streets

PRODUCTION :-: DEVELOPMENT

(Figures of Production and Stocks are in barrels of 42 Gals.)

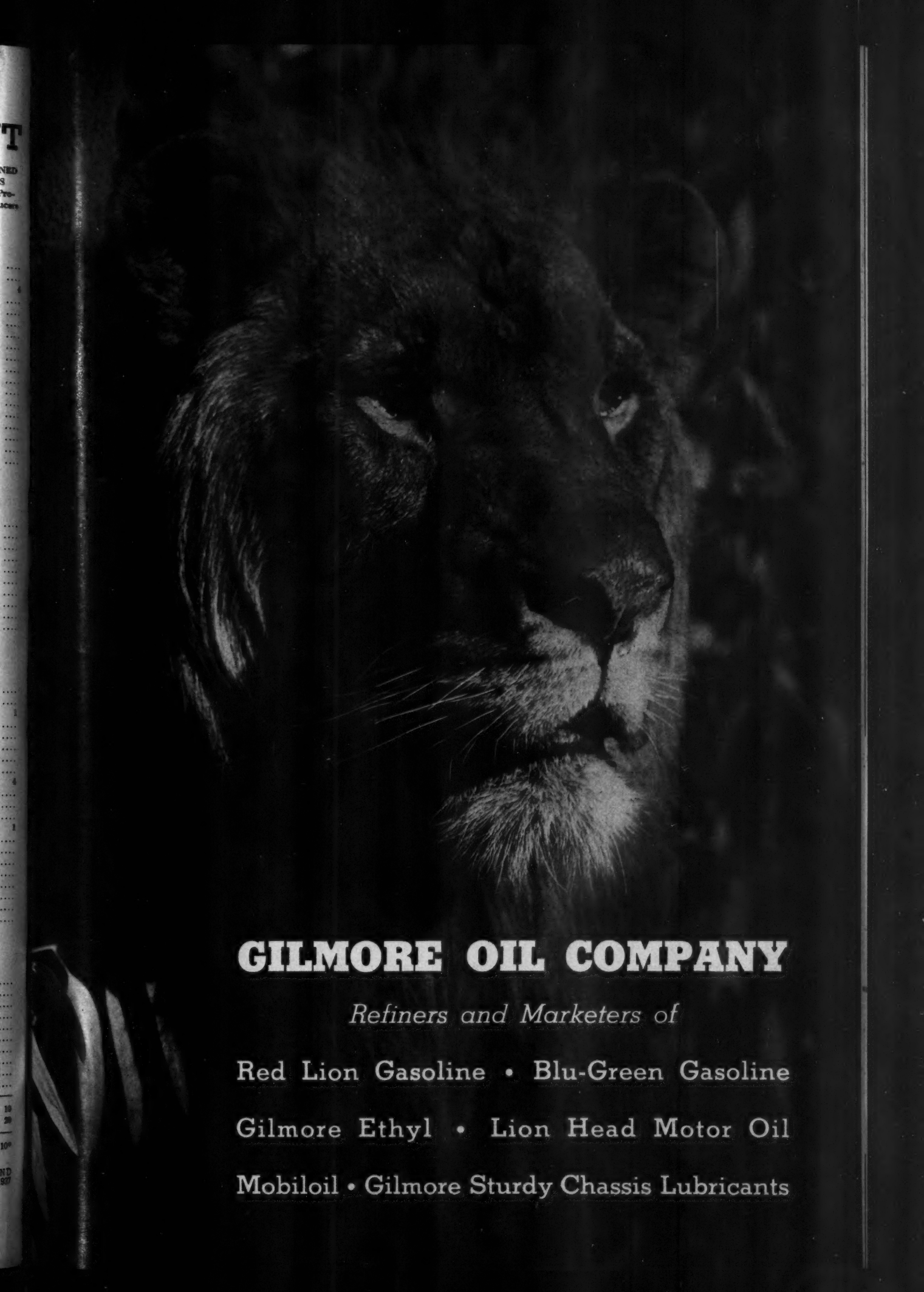
	Total Production September	—DAILY AVERAGE Sept., 1937	Aug., 1937	Sept., 1936
Group No. 1				
Belridge—North	482,865	16,296	15,758	12,738
Belridge—South	59,688	1,990	1,682	1,874
Coalinga	484,739	16,158	17,744	14,642
Edison	121,630	4,054	4,102	5,929
Elk Hills	332,082	11,069	10,505	8,323
Fruitvale	272,614	9,087	8,893	8,914
Greeley	54,716	1,824	1,737	.....
Kern River	468,164	15,605	15,804	13,767
Kettleman Middle Dome	3,094	103	107	312
Kettleman North Dome	2,414,986	80,500	78,423	77,630
Lost Hills	124,254	4,142	3,523	3,064
McKittrick	133,158	4,439	4,460	1,847
Midway-Sunset	2,232,065	74,402	74,761	59,219
Mountain View	550,900	18,363	17,449	23,228
Mount Poso	568,435	18,948	18,149	17,841
Round Mountain	413,860	13,795	13,473	11,665
Ten Sections	97,909	3,263	3,081	759
Wheeler Ridge	9,541	318	320	342
Group No. 2				
Capitan	88,224	2,941	2,886	1,641
Elwood	249,521	8,317	8,192	10,804
Rincon	97,537	3,251	3,249	2,149
San Miguelito	99,961	3,332	3,460	1,523
Santa Barbara	17,958	599	644	1,000
Santa Maria	384,580	12,819	14,432	5,304
Summerland	746	25	32	36
Ventura Avenue	1,048,060	34,935	34,805	33,683
Ventura-Newhall	153,522	5,117	5,308	4,926
Watsonville	1,800	60	60	60
Group No. 3				
Brea-Olinda	184,190	6,140	6,098	7,837
Coyote—East	123,373	4,112	4,001	2,547
Coyote—West	214,941	7,165	7,130	8,021
Domingues	899,834	29,994	29,097	25,149
El Segundo	380,645	12,688	11,247	419
Huntington Beach	1,081,438	36,048	35,656	36,122
Inglewood	479,440	15,981	15,755	12,691
Lawndale	2,308	77	78	113
Long Beach	1,778,523	59,284	57,957	67,583
Los Angeles-Salt Lake	16,974	566	566	867
Montebello	241,397	8,047	8,336	9,151
Playa Del Rey	235,423	7,847	7,930	11,839
Potrero	7,092	236	207	288
Richfield	263,569	8,786	8,824	6,449
Rosecrans	114,918	3,831	3,805	2,333
Santa Fe Springs	1,260,711	42,023	42,763	44,292
Seal Beach	278,867	9,296	9,507	9,579
Torrance	228,616	7,620	7,760	8,790
Whittier	27,377	913	902	890
Wilmington	1,763,333	58,778	53,656	.....
Total	20,555,578	685,184	673,422	579,170
August	20,876,078	673,422		
Increase	*320,500	11,762		

*—Decrease.

STOCKS HELD IN PACIFIC COAST TERRITORY BY CALIFORNIA OIL COMPANIES

	Sept. 30, 1937	Aug. 31, 1937	Sept. Changes	Sept. 30, 1936
1. Fuel Oil Residuum and Non-Gasoline-Bearing Crude	63,199,156	62,430,828	+768,328	64,548,030
2. Gas Oil and Diesel Oil	6,909,395	6,479,092	+430,303	9,010,602
3. Gasoline-Bearing Crude	30,642,228	31,185,125	−542,897	34,116,257
4. Unblended Nat. Gas	2,210,146	2,639,774	−429,628	2,062,041
5. Gasoline (not including distributing and service stations)	10,930,937	10,489,889	+441,048	11,014,468
6. Naphtha Distillates	1,946,166[1]	1,945,097[1]	+ 1,069	1,819,753[1]
7. All Other Stocks	5,935,837[2]	6,054,279[2]	−118,442	8,335,493[2]
TOTAL	121,773,865	121,224,084	+549,781	130,906,644
[1]Estimated amount of unfinished gasoline contained in item 6	1,582,224	1,608,405		1,460,427
[2]Coke included in item 7	46,571	64,783		291,849

	New Rigs Up	Active Drilling	Producers Completed	Daily Initial Output	Active Producing	ABANDONED WELLS Drillers	Producers
Group No. 1							
Belridge—North	4	6	2	6,895	46	....	....
Belridge—South	..	....	....	....	188	....	....
Coalinga	1	2	....	....	897	....	4
Edison	3	3	1	100	91	....	....
Elk Hills	..	....	....	....	178	....	....
Fruitvale	4	4	4	1,207	158	2	....
Greeley	2	5	1	3,489	6	....	....
Kern River	6	4	4	553	1,328	1	....
Kettleman Middle Dome	..	1	....	....	3	....	....
Kettleman North Dome	..	12	2	3,322	166	....	....
Lost Hills	4	1	3	434	270	1	....
McKittrick	2	....	....	....	208	....	....
Midway-Sunset	13	15	6	1,531	2,464	1	....
Mountain View	4	9	7	4,115	189	....	....
Mount Poso	13	10	4	1,181	262	3	....
Round Mountain	6	4	8	2,588	146	1	....
Ten Section	2	2	1	3,267	6	....	....
Wheeler Ridge	..	....	....	....	25	....	....
Group No. 2							
Capitan	..	....	1	37	36	....	....
Elwood	..	....	....	....	83	2	....
Rincon	1	3	....	....	35	....	....
San Miguelito	..	3	....	....	13	....	....
Santa Barbara	..	....	....	....	38	....	....
Santa Maria	8	14	8	7,151	260	....	....
Summerland	..	1	....	....	19	....	....
Ventura	2	8	3	235	224	....	....
Ventura-Newhall	1	22	....	....	573	....	....
Watsonville	..	....	....	....	7	....	....
Group No. 3							
Brea-Olinda	..	1	....	....	371	....	....
Coyote—East	1	....	1	50	80	....	....
Coyote—West	..	1	....	....	34	....	1
Domingues	2	4	4	2,334	154	....	....
El Segundo	12	15	5	10,065	31	1	....
Huntington Beach	..	....	1	195	574	....	....
Inglewood	..	1	....	....	196	....	....
Lawndale	..	....	....	....	6	1	....
Long Beach	4	6	2	1,251	1,233	....	4
Los Angeles-Salt Lake	..	....	....	....	113	....	....
Montebello	1	....	....	....	206	....	....
Playa del Rey	..	....	1	147	205	1	....
Potrero	..	1	....	....	10	....	1
Richfield	3	5	....	....	282	....	....
Rosecrans	1	4	1	359	80	....	....
Santa Fe Springs	..	2	....	....	657	....	....
Seal Beach	..	1	....	....	113	....	....
Torrance	..	3	2	71	535	....	....
Whittier	1	1	....	....	155	....	....
Wilmington	28	28	27	25,343	277	....	....
Miscellaneous	14	42	....	....	....	13	....
Group No. 4—Gas Fields							
Buena Vista Lake	..	....	....	....	....	....	....
Buttonwillow	..	....	....	....	....	....	....
Chowchilla	..	....	....	....	....	....	....
Delano	..	....	....	....	1	....	....
Dudley Ridge	..	....	....	....	....	....	....
Goleta	..	....	....	....	1	....	....
McDonald Island	1	1	....	....	4	....	....
Rio Vista	1	2	1	Gas	2	....	....
Semi-Tropic	..	1	....	....	....	....	....
Tracy	..	....	....	....	6	....	....
September	145	248	100	75,920	13,245	27	10
August	108	247	103	37,966	13,074	31	20
Increase (*Decrease)	37	1	3*	37,954	171	4*	10*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Refiners and Marketers of
Red Lion Gasoline • Blu-Green Gasoline
Gilmore Ethyl • Lion Head Motor Oil
Mobiloil • Gilmore Sturdy Chassis Lubricants

Increase In Production Recommended By Bureau

Increase proposed in spite of winter season and September additions to storage in California. Figure set at 674,600 bbls., 14,600 more than October allocation.

In line with the U. S. Bureau of Mines recommendation for November, the Central Committee has set the California allowable at 674,600 bbls. per day, an increase of 14,600 bbls. over the October allowable of 660,000 per day. As is the Committee's custom, it has announced that it will allocate not more than the 674,600-bbl. figure, keeping back, at present, sufficient unallocated production to take care of new production during the month.

In October, with an allocation of 660,000 bbbls. per day possible, the total oil actually allocated was 622,420 bbls. per day, new wells brought in during the month not requiring the allocation of the full amount.

However, that both the Bureau's recommendation and the committee's allocation are more or less immaterial and irrelevant to actual production has been amply demonstrated for the past several months, particularly since production has been climbing in an unbroken curve for some time. In October, for instance, when 622,420 bbls. out of a total of 660,000 bbls. had actually been allocated, actual production was practically 700,000 bbls. per day. It stands to reason that the same condition will apply during November, namely, that production will approach if not exceed 700,000 bbls. per day, even though the Central Committee allocates considerably less than that.

Production levels are high admittedly because the market demand has been exceptionally good, the offshore demand maintaining levels that have hardly been approached heretofore, and certainly not within recent years. Offshore demand in turn is high because of war-like, even if undeclared, wars in various parts of the world, with countries not actually engaged in military pursuits preparing for them. How long this condition will continue is of course in the laps of the gods, but that it has created something of a boom in the California oil industry cannot be denied.

A note of warning, however, has been sounded. For the first time in many months, some oil was added to storage during September. The slight addition, approximately 500,000 bbls., is not particularly a cause of concern, especially when it is realized that certain classifications of stocks are actually below generally-considered working levels, but it is of interest to note that storage was added to, thus reversing the trend of nearly a year.

The Bureau's increased recommendation for November, generally a month of lower demand, is explained by the considerable offshore demand together with the abnormal demand of November of last year. If, as has been suggested, the Bureau is forecasting demand for future months upon the performance of past months rather than making an effort to determine the actual demand of the future month in question, the additional production recommended for November of this year can be explained by the abnormal demand of last November.

National Situation

The daily average supply of domestic crude oil estimated by the Bureau of Mines to meet the demand in November is 3,509,000 bbls., 59,100 less than the daily average estimated for October, 1937. However, it is 475,100 bbls. (16%) higher than the actual daily production for November, 1936, and 12% higher than the actual demand for domestic crude for that month.

Crude oil production during the four weeks Sept. 4 to Oct. 2 averaged about 3,665,000 bbls. daily. During that period crude oil stocks declined 1,381,000 bbls. net, of which 1,061,000 was in domestic grades, indicating a daily demand for domestic crude during this period of 3,703,000 bbls. This demand, which represents a new record even though the period was one of declining gasoline consumption, was much larger than generally anticipated probably because of (1) continued heavy movements abroad, (2) relatively low gasoline yields, and (3) below average reductions in gasoline stocks.

Motor Fuel

Allowing for an upward adjustment in the estimate of motor fuel demand in November to reflect a growth in the seasonal importance of that month, the estimate of domestic demand is 43,800,000 bbls., nearly 10% higher than the actual for November, 1936.

Returns to the Bureau from the exporters of motor fuel indicate a continuation of the heavy movement abroad, hence the estimate of exports of motor fuel for November have been raised to 3,500,000 bbls., 250,000 higher than the October estimate.

Stocks of finished and unfinished gasoline amounted to approximately 64,000,000 bbls. on Oct. 31. Although this was about 11% higher than the comparable total for 1936 (57,662,000 bbls.), the day's supply was the same for both periods, namely, 41 days. Although gasoline stocks generally increase slightly in November, the Bureau has estimated no change in gasoline stocks for November, 1937.

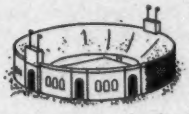
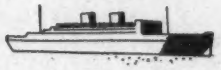
Benzol and "direct" sales and losses of natural gasoline have been estimated as 800,000 bbls., making the estimated production of gasoline 46,500,000 bbls., or 1,5550,000 daily.

Crude Petroleum

Natural gasoline consumption at refineries in November is estimated as 8.9% of the total gasoline required, or 4,140,000 bbls. The yield of straight-run and cracked gasoline is estimated as 43.3%, which when applied to the estimated straight-run and cracked gasoline production of 42,360,000 bbls. gives refinery crude oil requirements as 97,770,000 bbls., or 3,259,000 daily.

Foreign crude run to stills is estimated as 2,400,000 bbls., or 300,000 less than the previous month's estimate.

Who listens to the ASSOCIATED FOOTBALL SPORTCASTS?

MORE people listen to the Associated Football Broadcasts than to any other radio show in the West. All of the stadiums  on the Pacific Coast combined could not hold this great radio crowd. But who are they? Why aren't they at the games? They are people in far-off places, lumber camps, on construction jobs, in mines . . . agriculturists, folks many cities away. They are travelers,  on land, on ships at sea. They are people whose duties keep them, who listen as they work or as they ride. They are in hospitals, in sanitariums . . . children, veterans, aged. They are invalids at home. They are fans who could not follow their local team to a contest miles away. They are folks in public places, in hotel lobbies, in front of downtown radio stores. These are the listeners to Associated's Football Broadcasts. Plus you, your family, your friends when time or circumstance keeps you from the stadium. Tide Water Associated Oil Company is pleased to present the Football Sportcasts as . . .

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Ickes Issues Regulations For Permit Extensions

Prospecting permits on public lands can be extended to Dec. 31, 1939, if they conform to rules issued by Sec. Ickes.

Secretary of the Interior Harold L. Ickes has announced that oil and gas prospecting permits are eligible for extension to Dec. 31, 1939, under the provisions of the act of Aug. 26, 1937 (Public No. 388), only if (1) they are outstanding on Dec. 31, 1937, and if (2) they properly fall, on Dec. 31, 1937, within one of the following classes:

(a) Permits which have been committed in whole or in part to a cooperative or unit plan of development and operation that on Dec. 31, 1937, has been approved or prescribed by the Secretary of the Interior, or is in process of revision or reconsideration pursuant to prior review, without rejection, in the Department of the Interior;

(b) Permits which, together with one or more other permits, have been committed in whole or in part to a cooperative or unit plan of development and operation for the whole of any single oil or gas pool or field (or reasonably compact area) that was filed before Jan. 1, 1937, and rejected pursuant to instructions of said Secretary;

(c) Permits under which approved drilling was actively in progress at some time within the calendar year 1937;

(d) Permits under which at least one well shall have been drilled to a depth of not less than two thousand feet subsequent to Aug. 21, 1935;

(e) Permits which have been issued subsequent to Aug. 21, 1935, and for which timely compliance has been made with the drilling requirements of section 13 of the act of Feb. 25, 1920, to the extent required by Dec. 31, 1937, or, in the absence of such timely drilling, for which an acceptable cooperative or unit plan of development and operation has been filed on or before said date.

Other Classes

Permits still outstanding on Dec. 31, 1937, which do not fall within one or more of classes (a) to (e), will not be considered eligible for further extension and will cease and terminate automatically without notice of cancellation on the final date of their current term. Permits whose initial two-year term expired on or prior to Aug. 21, 1937, or whose extended term expired or will expire prior to Dec. 31, 1937, are eligible for extension to Dec. 31, 1937, if application for extension has been or will be filed before the final date of their current term and if equities warranting extension exist in conformity with the existing departmental practice with respect to extensions. Permits which were issued subsequent to Aug. 21, 1935, and whose initial two-year terms expire prior to Dec. 31, 1937, are extended to that date by the act of Aug. 26, 1937, to enable compliance with the conditions specified in clause (e) of the act of Aug. 26, 1937.

Secretary Ickes explained that the current term of a permit must be considered as expiring on:

(1) The last date of the initial term for which the permit was issued where no extension has been granted by act of Congress or by the Secretary of the Interior; or

(2) The last date of the final extension

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- 30 Second Installation
- Absolutely Fluid Tight
- Can be Removed and Replaced With Casing in Motion.
- Can be Used for "Washing In" Casing

MacClatchie "Quick Change" Cement Heads can be installed in less than 30 seconds and removed in even less time.
Their construction assures a fluid tight seal—the greater the pressure within the casing, the tighter the engagement of the slips and the rubber.
MacClatchie Heads can be removed or replaced with the casing in motion, eliminating the necessity of setting slips or removing elevators. There is no need to disconnect the cement or mud lines as the head is not rotated when inserting or removing—only the nut on the mandrel of the head is turned.
MacClatchie Heads, besides being used for cementing, are particularly handy for circulating or "washing-in" casing. Inserting the head while the pipe is in motion not only saves time but prevents "freezing" which often occurs when the pipe is not kept moving.

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when one or more extensions have been or will have been granted by the Secretary; or

(3) Dec. 31, 1937, with respect to all permits extended by the act of Aug. 21, 1935 (49 Sta. 674) or by subsection (e) of the act of Aug. 26, 1937, which will not qualify for extension to Dec. 31, 1939; or

(4) Dec. 31, 1939, with respect to all permits which will qualify for extension to that date under the act of Aug. 26, 1937.

Some Permits Cancelled

The secretary stated that a considerable number of permits, which were not extended to Dec. 31, 1937, by the act of Aug. 21, 1935, or by departmental order, and whose initial or extended term had expired on or prior to Aug. 21, 1937, without application for extension of time or application to exchange the permit for a lease having been filed prior to their respective expiration dates, have already been terminated and canceled automatically by the act of Aug. 26, 1937.

Right to a lease on discovery made within the current term of a permit remains unimpaired; and the act does not disturb the authority of the Department to cancel any permit for proper cause within the period covered by its current term.

The act also does not affect the Department's authority to issue a lease under the act of Aug. 21, 1935, in exchange for a permit in good standing, on application of the permittee filed prior to the expiration of the current term.

The act of Aug. 26, 1937, is itself notice to all permittees of its provisions, and formal notices to the permittees, whether of extensions granted by the act or of terminations of the permits under its provisions, are not necessary. However, any interested party who makes inquiry will be advised as to the status of the permit under the new law.

Secretary Ickes indicated that the new legislation is applicable to nearly 8000 permits issued on applications filed prior to Aug. 21, 1935. The act of that date substituted a leasing system with a minimum royalty of 12½% for the permit system and minimum royalty of 5% provided for in the leasing act of 1920. About 6000 of these permits are past the two-year period of their initial term but have remained outstanding, some of them for 10 to 15 years, under extension provisions of various acts of Congress. The current term of the majority of these permits will expire Dec. 31, 1937. From 1500 to 2000 of the outstanding permits affected by the new act are now in their initial term.

Annual Hi-Jinks Set For Dec. 17

According to the California Oil and Gas Association, unauthorized rumors have been circulating to the effect that the date of the Annual Banquet and Christmas Jinks of the Association is Dec. 24. The true date is Dec. 17, Friday, and the place is the Biltmore Bowl, Los Angeles. Invitations will be issued in due course.

Jones Safety Man For Ethyl Corp.

Ellis O. Jones, Jr., has been made director of safety for the Ethyl Gasoline Corp. Los Angeles district, which includes the seven western states. Mr. Jones is a graduate of the Massachusetts Institute of Technology and has been with Ethyl since 1932.

Nobmann New Pacific Oil Safety Chairman

C. J. Nobmann has been made Pacific Division chairman of the Petroleum Section of the National Safety Congress. Mr. Nobmann is with the Shell Oil Co. in San Francisco. H. W. Boggess, Sinclair Prairie Oil & Gas Co., Tulsa, is general chairman of the section, with J. H. Brown, Tidewater Oil Co., New York, vice-chairman.

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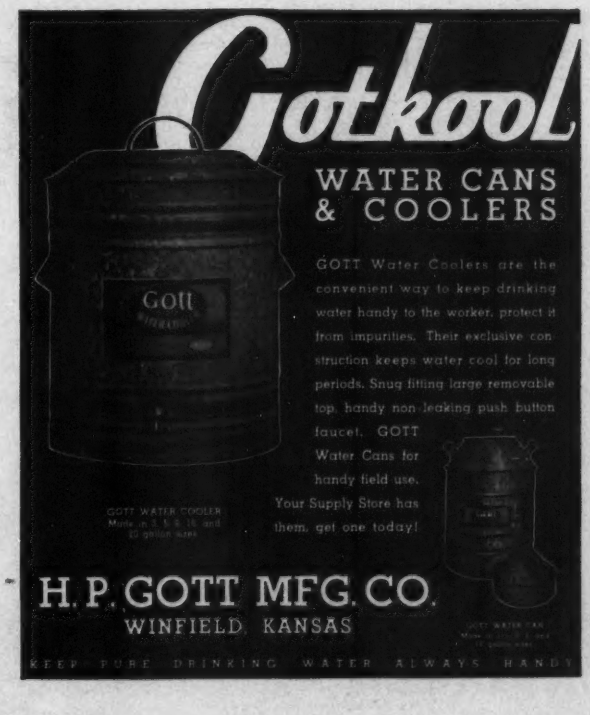
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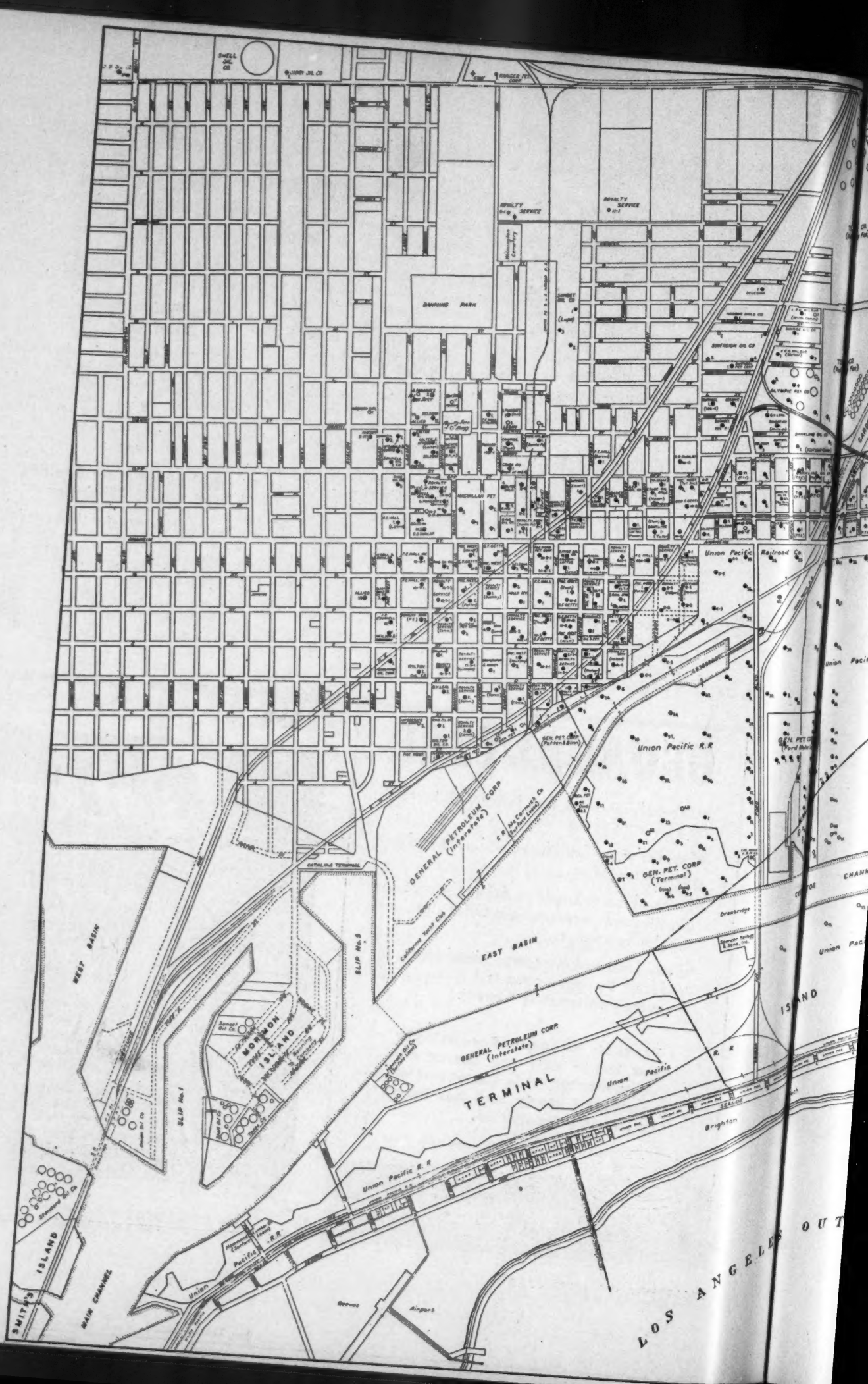
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Field Development

Los Angeles Basin

Drilling Activity, Output At Wilmington In Balance

With many operators active in the northwest portion of the field, both drilling activity and total production are holding practically even at Wilmington. For the past two months the number of wells actually drilling has remained almost constant at 25, the number of new wells started balancing completions.

Total field production is approximately 61,285 bbls. per day, an increase of 500 bbls. over the figure reported two weeks ago, and due chiefly to consistently good completions by General Petroleum and Union Pacific. A breakdown of the total production figure shows almost 50,000 bbls. being produced by the five largest operators, divided as follows: Union Pacific, 18,500; General Petroleum, 15,000; Royalty Service, 8000; Bankline, 5500; Getty (and Pacific Western), 2800. These companies have a total of 190 wells on production for an average of slightly more than 260 bbls. per well as against the field average of 231 bbls. for the total number of 273 wells.

A comparison of these averages with those for a month ago shows an increase of 11 in number of wells on production and also an increase of 11 bbls. per day in average daily production per well. This may be satisfactorily accounted for by the fact that although there have been many more than 11 new wells completed, approximately half have been those of Union Pacific and General Petroleum for better than former average yields, and a number of marginal wells have been taken off production, some to be deepened.

The General Petroleum Corp. obtained the largest recent completion in Ford No. 5-A which was brought in from both Terminal zones flowing 2566 bbls. per day from 4090 ft. Oil sands open are from 3565 ft. to bottom with the exception of a 40-ft. blank interval from 3940-3980 ft. In compliance with its curtailment policy, the company has beaned production to 695 bbls. with a 22/64 orifice. Flow pressure is 500 lbs. and the oil is clean, testing 29.2 gravity.

On the Isco lease the same company completed No. A-6 with initial production of 1100 bbls., later installing a 16/64 bean to cut the output to the allowable figure of 230 bbls. The well is bottomed at 3575 ft. and draws from the Ranger and Upper Terminal zones. Union Pacific completed No. 44 at 3348 ft. flowing 706 bbls. per day of 22 gravity clean oil and well No. C-6 flowing 450 bbls. of 18 gravity oil from a depth of 3495 ft.

Under the stimulus of good completions by Sonwell and Selegna in the extreme northwest area, many new wells are now getting under way. In the vicinity of the corner of Denni and Lakme Sts., Royalty Service has made three new locations, Caminol one and, two blocks east, Legan Oil Co. one. At the corner of Anaheim and Ford, Mid-Cal Oil Co. is preparing to drill B. G. No. 5.

Completing well No. 12 for 500 bbls., Selegna Drilling & Production Co. set the pace in the northwest frontier and Sonwell Oil Co. ran a good second with well No. 3 whose initial was estimated at 475 bbls. Both wells are clean and are producing the interval 3000-3640 ft. In the same area, McDonald and Burns brought in Banning No. 2 from 3625 ft. flowing 300 bbls. and four blocks south at the corner of "E" St. and Lakme, Neilson, Dunwoody & Associates completed their first well for approximately 275 bbls. from a depth of 3669 ft.

The prospects of deep sand production in the townlot area have not as yet been improved by results obtained in the Royalty Service-Gilmore 842-2. With bottom plugged from 5775 ft. to 5747 ft. and the 6⅝-in. liner cemented through perforations at 5674 ft., the well flows 210 bbls. of 25.5 gravity oil cutting 10% on gas lift.

No production tests have been made in Pacific Western's Ronan Community No. 1, which is now coring below 5000 ft.

El Segundo Area Still Field Of Paradoxes

Developments of the last few days in El Segundo have only served to emphasize the already known peculiarities of the area. Further demonstrating the truth of the local axiom that "the more oil sand found and the better its appearance, the less chance of getting a good well," the Richfield Oil Co. Howard No. 1 and the Ohio Oil Co. Gough No. 8 are apparently in the low gravity pumper class along with Union Oil's El Segundo No. 3 in the opposite corner of the field. Howard No. 1, northwest outpost, was carried to 7404 ft., encountering the top of the conglomerate oil sand at 7450 ft. A 5-in. liner was landed on bottom which included 60 ft. of perforations and the hole thoroughly washed with oil. Swabbing, however, failed to make the well flow and pumping equipment is now being installed. Several days' swabbing in Ohio's Gough No. 8, also a northerly well, and an offset to Getty's drilling well, have resulted only in the recovery of 15 gravity oil and the company is contemplating installing a pump. Total depth is 7615 ft., conglomerate having been cored from 7638 ft. to the top of the schist at 7613 ft. Developments in these wells indicate that the limits of commercial production have probably been reached in this direction.

South of the Ohio No. 8 and west of the Howard No. 1, Pacific Western has completed Goodwin No. 1 flowing 675 bbls. of 26.5 gravity oil cutting less than 1%. This well cored the top of the conglomerate at 7357 ft. and penetrated only one foot of schist to 7436 ft. In No. 4, southernmost well on the Refinery property, the Standard Oil Co. picked up the top of the conglomerate at 7250 ft. and is still in the same formation at 7290 ft. Security No. 5, of The Texas Co., offsetting the No. 4 Standard well, is drilling ahead in schist below 7325 ft. after coring the top at 7280 ft. and the top of the oil sand at 7230 ft. Well No. 3 in what should have been a better location, would not flow on the gas lift and is now pumping a little over 100 bbls. per day.

Although but few new wells have been started in the northwest townlot area, several drilling wells are approaching interesting depths. Apex Petroleum Co. Elsie No. 1 has starting coring for the top of the schist below 6700 ft., and Richfield McCray No. 1 and Ruchti Petroleum No. 4 will have picked up the zone by the time this is off the press. The next 30 days will be a very interesting and critical period in the history of this field, especially the northwest extension, as the northeasterly and southerly productive limits are now fairly well defined.

Checking out somewhat lower than had been anticipated, the Tidewater Associated Oil Co. Leuzinger No. 1 in sec. 8, east of the field, continues to core hard brown shale below 7500 ft. Present plans call for continuation of drilling until either the conglomerate zone or the basement is reached.

Union Long Beach Extension Well In

In the Hilldon area, Union Oil Co. Oil Operators No. 1 was completed as a 350-bbl. pumper from 4155 ft. after opening 50 ft. of the Alamitos zone, and Flood Control No. 3 of the Hilldon Oil Co., with 80 ft. of zone penetrated is flowing 275 bbls. per day. Both wells are clean and produce oil of 24 gravity.

Hilldon's first producer, Amebco No. 1, is now flowing 395 bbls. and Amebco No. 2, which stopped flowing two weeks ago, is now flowing 465 bbls. per day on the gas lift.

Activity Nears In Long Beach Area

Presented in this issue is a map covering the entire Wilmington-Long Beach Harbor area prepared by the engineering staff of J. R. Pemberton, oil umpire. Included are all locations in the City limits of Long Beach that were turned in to the State Division of Oil & Gas with notice of intention to drill up to date of final revision. Exception is made in the case of locations made by the city on municipally owned lands and whose legal status is still doubtful pending court settlement. The one City of Long Beach location shown, near the Navy Landing, has been selected as one least vulnerable to legal attack and will be drilled immediately upon opening the area. Several properties shown as A. T. Jergins leases are actually held jointly by the Jergins interests and the Superior Oil Co. and will be drilled by the latter company. With permits to drill being made available on and after Nov. 12, it is expected that the port district will soon resemble the proverbial beehive in activity.

Union Bell 100 Now Making New Hole

After several months of slow and tedious redrilling the Union Oil Co. has finally passed the old bottom of 10,789 ft. in Bell No. 100 and is now coring below 10,810 ft. Although no information regarding formations is officially forthcoming from the company, it is generally thought that showings have not been particularly good below the Lower Clark zone at approximately 9500 ft.

Sand Trouble Prevents Yorba Linda Completions

Sand trouble, the bugaboo of Yorba Linda operators, has prevented the completion of all recently started wells. Mid State Oil Co. Oliver No. 1 and Beverly Hills Petroleum Co. Fricke No. 1 are both bailing large quantities of sand together with about enough oil to pay the bailing cost.

San Joaquin Valley

Producer At Greeley Extends Field To East

Despite the fact that less than 40 ft. of productive sand was found, Standard Oil Co. KCL 12-2 in sec. 16, 29-26 has been brought in as a large well extending the field indefinitely to the east. After productivity was determined by a formation test made of the zone 7600-7631 ft., the hole was carried to 7711 ft. where another test showed sands below 7645 ft. to be wet and a plug was placed at 7640 ft. The 9-in. casing was cemented at 7580 ft., a 6⅝-in. liner, including 60 ft. of perforated, was landed on the plug and 2½-in. tubing was run to 7610 ft. with a packer at 7496 ft. The well came in after swabbing, flowing at the rate of 2100 bbls. per day on a three hour gauge through a 96/64 bean, with 80 lbs. flow pressure. The packer was later released experimentally and with a 50/64 tubing bean and a 96/64 casing bean production increased to a 3300-bbl. rate on a short gauge. The well is now standing shut in with 725 lbs. tubing pressure.

South of Standard's 12-2 and east of the discovery area, the Superior Oil Co. is rigging up Krause No. 1 in the northwest corner of sec. 21, and Standard is following with two offsets, 12-3 in sec. 16 and 11-12 in sec. 20.

The Standard Oil Co. will soon add two more producers in this rapidly developing field. Fleishauer Comm. No. 1, southernmost well in sec. 20, is standing cemented with 9-in. water string set over the top of the Greeley sand which was cored at 7700 ft. and KCL 11-9 in the same section has cemented 9-in. after picking up the oil sand at 7650 ft. In sec. 17, KCL 11-10 cored only gray sand with streaks of oil sand in a zone which was topped at 7665 ft. KCL 17-1 is being spudded in the southwest quarter of sec. 9 and if successful will extend the field three quarters of a mile to the north of KCL 12-2.

The rather doubtful success attained in the company's KCL No. 9 in sec. 3, 30-26 has not discouraged the Superior Oil Co., which is drilling No. 10 in the same section and is rigging up Krause No. 1 in sec. 21, 29-26.

In the belief that the inflow of mud which killed KCL No. 9 may have been due to casing failure, the tubing was pulled and rerun with a packer which was set just above the gun perforated intervals, 7558-7580 ft. The well is now being swabbed.

Mountain View Outpost Wells Not Successful

Recent tests of outpost wells in the Mountain View field have met with but mediocre success and have resulted in one abandonment. Hogan Petroleum Co., after making several formation tests at intervals to bottom at 6132 ft., has abandoned Wharton No. 9 in sec. 32, 30-29.

The Petrol Corp. is having but little success in attempting to put DiGiorgio No. 1 on the producing list. With the bottom 105 ft. of the hole open the well was swabbed dry, oily water entering at the rate of only 1½ bbls. per hour. Fifteen feet of schist was cored to bottom at 5815 ft.

Ohio Oil Co. Derby No. 6, an easterly edge well in sec. 33, 30-29, shows possibilities of making a small well if the sand trouble can be overcome.

Superior Leasing South Of Lillis-Welsh Well

The Superior Oil Co. has been leasing in the area south of the Lillis Welsh well drilled by the Union Oil Co. and is expected to start a test well soon in sec. 20, 16-13.

Calif. Western Gets Round Mountain Well

Adding another good well to its list of successful Round Mountain completions, the California Western Oil Co. brought in its No. 6 in the se¼ of sec. 12, 28-28 as a 350-bbl. producer. With hole bottomed at 1778 ft., the 8⅝-in. water string was cemented at 1729 ft. and the well finished with a 6⅝-in. perforated liner. No. 7, another extension well, is now drilling below 1600 ft. and rig has been built for No. 8.

Illustrating that the older developed area still has excellent potentialities, the Honolulu Oil Co. completed No. 75 in sec 18, 28-29 with an initial of 325 bbls. with the zone open from 1810 to 1875 ft.

Offsetting his recently completed Larkin No. 1, H. A. McDonald is preparing to drill Bell No. 1 in the nw¼ sec. 12, 28-28. The completion of Larkin No. 1 extended the northwest area developed by California Western by approximately half a mile.

In the East Round Mountain field, Eastmont Oil Co. Olcese No. 4 was deepened from 1750 ft. to 1780 ft. and recompleted from 45 ft. of zone producing 320 bbls. cutting 25% and Tampico Petroleum Co. B&G K-4 in sec. 17, 28-29 is being completed from 1866 ft.

Strassburger No. 14 Makes 135 Bbls. Daily

Completing its second good Kern Front well in the last few weeks, the Republic Petroleum Co. put Strassburger No. 14 in sec. 24, 28-27 on the pump with initial production of 135 bbls. of 14.8 gravity oil cutting 3.0%. Hole is bottomed at 1986 ft. after penetrating over 200 ft. of the Kern River sand. Cal. Tech. No. 3 in the same section was recently brought in for more than 200 bbls. from a depth of 1868 ft.

Fruitvale Extended By Western Gulf

Limits of the Fruitvale field were extended to the north with the recent completion by Western Gulf of KCL B-28 in sec. 14, 29-27. Drilled to 3058 ft., 8⅝-in. casing was cemented at 3019 ft. and after landing a perforated liner on bottom the well was put on production flowing 236 bbls. in 19 hours, cutting 8%. In common with other wells in this section of the field, sand trouble has been experienced and is not as yet fully overcome.

Offsetting B-28 to the south, Meridian Oil Co. is preparing to spud fee No. 4, moving equipment from Turner No. 6, recently drilled to 3072 ft. and completed as a 160-bbl. clean well.

Extending the field to the south by one location, Western Gulf completed Red Ribbon Ranch No. 9 with initial production of more than 450 bbls. per day from 3525 ft. Production has now settled to 300 bbls., 17 gravity clean oil, open flow through 2½-in. tubing. No. 10 has been spudded one location to the east and is drilling below 2200 ft.

Fishing Job Holds Up Progress In Wasco Well

After briefly holding the distinction of being the deepest active well in the state, a serious fishing job at 11,584 ft. has forced the Continental Oil Co. KCL A-2 at Wasco to relinquish the honors back to Kenda 4-18J which is coring at 11,678 ft. in the Kettleman Hills.

Union Oil Starts Wildcat 20 Miles From Coalinga

In a hitherto unexplored area, 20 miles north of Coalinga, the Union Oil Co. has made a location for an exploratory test to be drilled on the Nicholson property in sec. 17, 15-15. It is understood that the site was chosen after making an extensive geophysical survey and thoroughly checking the surface geology.

Reserve Area Gets New Drilling Activity

After a short period of inactivity, the Reserve Oil Co. has announced plans for a new well to be drilled in the Grapevine area. This project, which will be drilled by the Universal Consolidated Oil Co., is located in sec. 33, 11-19 on the Tejon Rancho approximately 330 ft. south and 660 ft. west from the successful gasser, No. 33-3.

With the completion of the Rancho Gasoline Corp. absorption plant, Reserve No. 33-3 was opened up Oct. 12 after being shut in for some months, and is delivering 5500 mcf. under 1500 flow pressure. Plant recovery is about 0.4 gal. per 1,000 cu. ft. and the dry gas is being taken by the Southern California Gas Co. This well, with 50 ft. of zone open from 4380 to 4430 ft., when first completed, flowed 5000 mcf., testing ¾ gal. per thousand, with pressures of 1600 lbs. on the tubing and 1750 lbs. on the casing.

Ring Completes Two 250-Bbl. Mt. Poso Wells

Two more good producers are credited to the Ring Oil Co. with the completions of Nos. 2 and 3 on the Bohn property in sec. 32, 26-28. No. 2 was brought in from 1690 ft. pumping 250 bbls. with 60 ft. of Vedder Zone open and No. 3 has just been put on the pump for a like amount.

D. G. Vedder's B.N.B. No. 3, a southerly offset to the Bohen lease, was drilled to 1752 ft. and after setting an 8⅝-in. water string at 1709 ft. was completed as a 215-bbl. pumper. In completing Vedder No. 5 in the nw cor. of the ne¼ sec. 28, 26-28 the Sunset Oil Co. extended its proven holdings a quarter mile to the northeast. Although sand trouble has not been entirely overcome, the well is apparently good for 100 bbls. per day of 15 gravity oil, with 64 ft. of Vedder zone open to bottom at 1604.

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Standard Brings In Good Midway Well

The Standard Oil Co. brought in one of the best wells the Midway has seen in several years in No.3-13D, sec. 13, 32-24. A 6⅝-in. liner was landed on bottom at 3590 ft. and cemented through perforations at 3470 ft. Below the cementing point the liner is all perforated with the exception of the interval 3530-3592 ft., which is blank. Flowing through the 8⅝-in. casing, the well gauged 1581 bbls. in its first 15-hour test, a rate of more than 2000 bbls. per day. More remarkable is the fact that a 32/64 orifice was used and flow pressure was 400 lbs. After reducing the bean to 24/64 the production rate dropped to 708 bbls. of 23.4 gravity oil cutting 1.6%.

Round Mountain Well Makes 315 Bbls. Daily

The eastern extension area of Round Mountain has another producer in Tampico Petroleum Co.'s B&G K-3 in the northeast corner of sec. 17, 28-29. After overcoming preliminary sand troubles, a steady production of 315 bbls. of 16.9 gravity oil cutting 0.1% was obtained from 1867 ft. The top of the zone was cored at 1850 ft.

Belridge Completion Makes 3800 Bbls. Daily

The Belridge Oil Co. maintained its record of bringing in good wells in North Belridge with the completion of No. 53 in sec. 26, 27-20 as a 3800-bbl. producer. Bottomed at 8410 ft., 9-in. was cemented at 8050 ft., 25 ft. above the Wagon Wheel zone, and a 4¾-in. perforated liner was landed. Flowing through 2½-in. tubing with a 96/64 bean, the initial production rate was 3820 bbls.

Union To Make Test In Kernco No. 34-1

Preparing to make a production test in the deep Rosedale test, Kernco 34-1 in sec. 34, 28-25, the Union Oil Co. has cemented an 1172-ft. aluminum blank liner at 11,222 ft. and has cleaned out to bottom at 11,302 ft. When last reported, the tubing was being run to swab for production.

Carpinteria Well Derrick Erected

Another test of the Carpinteria area is getting underway as the Carpinteria Oil Co. has built a derrick for a well at the corner of Palm Ave. and Land Road within the townsite.

The Texas Co. Gets North Belridge Well

Proving that the North Belridge field limits are yet unknown, The Texas Co. completed Martin No. 1 in sec. 22, 27-20. Production cleaned up rapidly, gauging 79 bbls. per hour through a ¾-in. bean with pressures of 510 lbs. on the tubing and 400 lbs. on the casing. On potential test the flow attained a 2700-bbl. rate with 6800 mcf gas from both tubing and casing but is now beaned back to 412 bbls. of 32.5 gravity clean oil and 500 mcf gas. A 12/64 bean is in use which maintains 1700 lb. tubing pressure and 2650 lb. casing head pressure. Two hundred and eighty-five feet of the Wagon Wheel horizon is open, the 4¾-in. liner being landed at 8446 ft.

Ohio May Discover New San Joaquin Valley Field

Possibilities that the Ohio Oil Co. will score another California success seem very good as the company's KCL E-3 wildcat well in sec. 14, 30-25, northwest of the Shell Oil Co. Ten Sections production, cored good looking oil sand from 8095 ft. to bottom at 8129 ft. On a formation test the fluid reached the surface in 55 minutes, the well flowing at a 2000 to 3000-bbl. rate, with 15,000,000 c.f. of gas.

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Coastal District

Union LeRoy No. 2 Extends Santa Maria Area To West

A further extension of production in the Santa Maria Valley field is credited to the Union Oil Co. with the completion of LeRoy No. 2 almost two miles west of E. H. Moore's Union Sugar No. 2, heretofore the most westerly well and itself a mile west of the nearest established production. Although the water problem does not seem to be fully solved, the 100-bbl. production cutting 23%, it is probable that the trouble is mechanical and that subsequent wells may profit by the experience gained in this virtually wildcat test. After coring the top of the Monterey at 5018 ft. and the top of the Franciscan at 5300 ft., the hole was carried to 5334 ft. and 8⅝-in. casing cemented at 5035 ft. A series of formation tests indicated the bottom to be wet and a plug was set at 5280 ft., but further tests still showed water and a final plug was placed at 5230 ft. Then 222 ft. of 4¼-in. liner of which 195 ft. was perforated was landed on the plug and the well placed on the pump. The gravity of the oil is 16.4 and is similar to that produced in other portions of the field.

Two weeks of pumping has seen production in E. H. Moore, Inc., No. 2 build up to 475 bbls. per day and the water content drop to 3.5%. Gravity is 16.3, average for the field. Union Sugar No. 3, a southerly offset to Union Oil LeRoy No. 2, is approaching 4000 ft. in depth and will soon give a check on the possibilities of developing clean production in this area.

Consuming only 28 days between spudding and completing, the Pacific Western Oil Co. established something of a record in drilling Dal Porto No. 1 in sec. 27, 10-34. The well set 13⅜-in. casing at 763 ft., 9-in. at 4070 ft. and completed at 4422 ft. with 7-in. perforated liner landed on bottom. Spudded Sept. 25, no fishing jobs or mechanical difficulties of any kind were encountered and the drilling was conducted in a routine manner until completion Oct. 23 with initial production of 765 bbls. of 16 gravity oil cutting 2.0%.

In the Newlove Acres tract in sec. 23, Linnel Petroleum Co. has cored the top of the Monterey at 3070 ft. and is preparing to run casing.

The best recent producer was obtained by the Union Oil Co. when Vincent No. 4 in sec. 30 was brought in flowing 1717 bbls. of 15.7 gravity clean oil. A 6⅝-in. liner extends from the shoe of the water string at 2910 ft. to bottom at 4373 ft. with the interval 3925-4050 ft. blanked off. Vincent No. 3 was completed a few months ago as one of the banner wells of the field, flowing 3700 bbls. per day and Vincent No. 2 has been put on the pump as a 100-bbl. well cutting 15% after plugging bottom from 4065 ft. to 3405 ft.

Drilling crews have been moved from Vincent No. 4 to Russell No. 3 in sec. 21. This is Union's fourth well in the western proven area and is one location south of Russell No. 2 which was completed for more than 1000 bbls. as the first flowing well in the section. In the same section Union has spudded the first well on the Frank Vicente property and is drilling below 1500 ft.

In sec. 25, the Bush-Hancock combination is drilling Wylie No. 1 below 4000 ft. and has made a location for a third Hopkins well. California Lands No. 2 in sec. 30 is drilling ahead at 3050 ft.

Indicating that future field extensions must be to the west and south, Petroleum Properties, Inc. failed to find the Monterey present on the Rice property in sec. 19, and cored directly into the Franciscan metamorphics at 2191 ft., definitely marking the easterly limits of production.

Standard To Test Cat Canyon Area

The Cat Canyon area is to have another test with the Standard Oil Co. getting under way on the Las Flores Land and Oil Co. lease in sec. 27, 9-33. Although several wells have been drilled on this property in years past, none were structurally well located nor carried to sufficient depths to test the possibilities presented here.

Two New Wells Start In Camarillo District

In addition to the Richfield Oil Co. McFarland No. 1, drilling in volcanics at 4665 ft., two more wells are starting in the Camarillo area. The Southern California Drilling Co. is rigging up to drill an exploratory test of the Daly ranch in sec. 26, 2-21 and The Texas Co. is preparing to spud Edwards No. 1 in sec. 19, 2-21.

Light Oil Production At Oxnard Definitely Doubtful

Last hopes for obtaining light oil production in the near future in the Oxnard area are fading with Oxnard Oil Co. Vanoni No. 1 (sec. 10, 1-22) showing only fresh water and a little heavy oil on a bailing test. In order that no possibility may be overlooked, the operators plan to put the well on the pump on the theory that the water may be exhausted and a commercial quantity of oil recovered. The well is 6302 ft. deep and has been plugged to 6200 ft. to test the interval between that depth and the shoe of the pipe at 5680 ft.

Vaca Exploration Co. Livingston No. 1 in sec. 6, 1-21, which was completed on the pump three weeks ago from 4285 ft., is now pumping approximately 50 bbls. per day of nine gravity oil cutting 10% mud and sand.

California Crude Oil Production

For Two Weeks Ended October 28, 1937

Field	October Daily Quota	Average Daily Production	Excess
San Joaquin Valley			
Berridge—North	14,870	16,763	1,893
Beiridge—South	1,935	1,559	*376
Buena Vista	17,805	16,840	*965
Coalinga—East	11,715	11,071	*644
Coalinga—West	5,145	4,716	*429
Coffee Canyon	4,250	4,790	540
Edison	3,515	4,025	510
Elk Hills	8,630	11,047	2,417
Fruitvale	8,895	9,525	630
Greeley	2,250	2,518	268
Kern Front	10,400	10,403	3
Kern River	5,235	2,499	*2,736
Kettleman No. Dome	79,615	81,551	1,936
Lost Hills	4,710	4,240	*470
McKittrick	3,725	4,358	633
Midway-Lakeview	10,535	19,286	8,751
Midway-Maricopa	36,800	37,446	646
Mount Poso	16,490	19,094	2,604
Mountain View	17,355	17,510	155
Round Mountain	8,570	10,488	1,918
Ten Section	3,030	3,045	15
Other Fields	2,700	2,857	157
TOTAL	278,175	295,631	17,456
Coastal District			
Elwood	7,365	8,306	941
Rincon	2,790	2,728	938
Santa Maria	15,895	14,352	*1,543
Santa Paula-Newhall	5,210	5,158	*52
Ventura Avenue	32,405	34,694	2,289
Other Fields	6,505	7,160	655
TOTAL	70,170	73,398	3,228
Los Angeles Basin			
Alamitos Heights	1,255	1,728	473
Brea-Olinda	8,930	6,040	*2,890
Coyote—East	2,910	4,043	1,133
Coyote—West	9,295	7,059	*2,236
Domingues	25,135	29,501	4,366
El Segundo	6,085	23,732	17,647
Huntington Beach—New	16,610	21,412	4,802
Huntington Beach—Old	14,465	16,981	2,516
Inglewood	15,990	16,650	660
Long Beach	53,745	58,165	4,420
Montebello Extension	7,830	8,006	176
Playa del Rey	7,640	7,963	323
Richfield	7,575	8,665	1,090
Rosecrans-Athens	2,555	4,567	2,012
Santa Fe Springs	37,820	41,527	3,707
Seal Beach	7,675	7,804	129
Torrance-Hermosa and Extension	6,560	7,556	996
Wilmington	40,030	61,228	21,198
Other Fields	1,970	2,114	144
TOTAL	274,075	334,741	60,666
STATE TOTAL	622,420	703,770	81,350

*—Shortage.

Hancock Suspends Tests At Sherer-Dickes No. 1

Faced with possible isolation due to impassable roads, the Hancock Oil Co. has suspended all further tests of Sherer-Dickes No. 1 until the rainy season is definitely over next spring. Located in sec. 30, 12-33, the well was carried to 3361 ft. where a perforated liner was landed and a bailing test made, which indicated good possibilities of obtaining a small pumper of heavy oil.

Pet. Sec. Completes Home Ranch No. 6

Home Ranch No. 6, sec. 3, 3-19, was completed by the Petroleum Securities Co. recently flowing 235 bbls. of 38 gravity oil cutting 17%, with nearly 3000 mcf gas. Drilled to 4393 ft., 8⅝-in. casing was cemented on bottom and gun perforated between 3730 and 3755 ft.

State Drilling Report

Field	Company	Well	No.	Sec.	Twp.	Range
NEW WELLS						
Wilmington	Geo. F. Getty, Inc.		W-10	33	4S	13W
	Lokern Development Co.	Buchanan	1	33	4S	13W
	Macson Oil Co.	C-55	1	32	4S	13W
	Allied Petroleum Corp.	Allied	23	2	5S	13W
		Allied	26	32	4S	13W
	The Superior Oil Co.	L. B. Harbor	12 & 22	35	4S	13W
		Seaside	4-A, 4-B, 4-C	2	4S	13W
		Curtis Packing Co.	1, 2, 3, 4	35	4S	13W
		Locke Lease	1 & 2	35	4S	13W
		San Carlos	1	2	5S	13W
	Alford Development Co.	CY	3	22	4S	13W
	V. R. G. Wilbur	Santa Fe	2	33	4S	13W
	Western Exploration Co.	Mulvihill	1	32	4S	13W
	U. P. Railroad Co.	U. P.	65, 66 & 67	34	4S	13W
	Wilton Oil Co.		2	32	4S	13W
	Selegna Drilling & Producing Co.		10	33	4S	13W
	Legan Oil Co.		1	33	4S	13W
El Segundo	Wilshire Oil Co.	Elsie	9-1 & 9-2	12	3S	15W
	Sunshine Oil Co.	Grauman-Wallace	1	12	3S	15W
		Guaranty-Wallace	1	12	3S	15W
		Copinger-Wallace	1	12	3S	15W
	Richfield Oil Corp.	Santa Fe B	1	7	3S	14W
	Standard Oil Co.	Refinery	5	13	3S	15W
Long Beach	Richfield Oil Corp.	Malcolm-Davis	5	19	4S	12W
L. A. County	Wright Oil Tool Co.	Wright	1	1	5N	12W
	British-American Oil Producing Co.	Pico	1	12	2S	13W
Coyote Hills	Bachmann Petroleum Corp.	Page	1	22	3S	9W
Santa Maria Valley	Dougan Drilling Co.	Dougan-Yelkin	1	27	10N	34W
	Pacific Western Oil Corp.	Sanarin	1	27	10N	34W
	Signal Oil & Gas Co.	Highway Comm.	1	26	10N	34W
	Sunshine Oil Co.	Wallace	1	27	10N	34W
Santa Barbara County	Navy Oil Co., Inc.		1	20	10N	34W
	E. H. Moore, Inc.	Union Sugar	3	24	10N	35W
		Union Sugar	4	19	10N	34W
		Union Sugar	5	25	10N	34W
Ventura Avenue	Shell Oil Co.	Taylor	92	20	3N	23W
Ventura County	Southern California Drilling Co.	W. P. D.	2	26	2N	21W
Midway	Signal Oil & Gas Co.	Kendon	4	35	32S	23E
	Honolulu Oil Corp.		26-A	14	32S	24E
	Standard Oil Co.		127	33	32S	24E
Sunset	Pattiway Oil Corp.	Pattiway	3	12	11N	24W
	Standard Oil Co.	Monarch	19	26	12N	24W
Beiridge	The Texas Co.	J. D. Martin	2	22	27S	20E
	Richfield Oil Corp.	Beiridge	1-A	22	27S	20E
McKittrick	Franco-Western Oil Co.		14	8	30S	22E
Elk Hills	Richfield Oil Corp.	Crampton	3-H-A, 11-D-A	1	31S	24E
Lost Hills	Standard Oil Co.	United	6	2	26S	20E
Kern River	C. B. Morrison	Hobson	14	2	29S	28E
	Standard Oil Co.	Ward Fee	8	24	28S	27E
	Kern River Oilfields of Calif.		25-3B	25	28S	27E
Round Mountain	Tampico Petroleum Co.	Bass & Goodknight	K4	17	28S	29E
Fruitvale	Western Gulf Oil Co.		28-KCL-B	14	29S	27E
		Red Ribbon Ranch	10	27	29S	27E
Ten Sections	Shell Oil Co.	KCL-A	36-30	30	30S	26E
Mount Poso	The Texas Co.	Alta Vedder	12	4	27S	28E
	Dwight G. Vedder	B. N. B.	3	32	26S	28E
	Ring Oil Co.	Bohen	2	32	26S	28E
	Vanguard Oil Co.	Baker	8 & 15	33	27S	28E
Poso Creek	Pebble Beach Oil Co.	Roscoe-Stanley-Newhope	5	29	27S	27E
	Hobee Petroleum Co.	McVan	3	14	27S	27E
Kettleman North	Standard Oil Co.		21	13	22S	17E
Rio Vista	Amerada Petroleum Corp.	Deterding	1	36	4N	2E
Stanislaus County	The Texas Co.	Bacon	1	30	6S	8E
Fresno County	Dauphin Development Co.	Boone	1	30	21S	14E
DEEPEN OR REDRILL						
Huntington Beach	Pan Coast Oil Co.	Pan Coast	1	2	6S	11W
	L. H. Barnett		2	2	6S	11W
	Standard Oil Co.	Huntington A	13	3	6S	11W
Long Beach	Coastal Oil & Gas Co.		4	19	4S	12W
	Morton & Elder	Pauley	1	30	4S	12W
	Brennan Oil Co., Inc.	Beck	1	29	4S	12W
	Petroleum Securities Co.	Bixby	2	13	4S	13W
	Stanton Oil Co.	Hoyt	5	19	4S	12W
Wilmington	Graham-Loftus Oil Corp.	Pioneer	1	33	4S	13W
	A. C. P. Oil Co.	Community	1	33	4S	13W
Santa Fe Springs	A. Wardman	Wardman	2	6	3S	11W
Domingues	Union Oil Co.	Heilman	46	33	3S	13W
	Shell Oil Co.	Manuel	3	34	3S	13W
Playa del Rey	David D. Behr	Hunter	1	28	2S	15W
Ventura Avenue	Shell Oil Co.	Gosnell	10	28	3N	23W
	Tidewater Associated Oil Co.	Lloyd	135	27	3N	23W
	Richfield Oil Corp.	Hobson Fee	5	8	3N	24W
Rincon	St. Louis Oil Co.	Pirie	1	13	4N	23W
Ojai	Calumet Oil Co.		16	3	3N	19W
Bardsdale	Union Oil Co.	Bell	7	1	8N	33W
Cat Canyon	Quality Oil Co.	W. P.	3	27	32S	23E
Midway	Standard Oil Co.		76	1	32S	23E
	Pyramid Oil Co.		12	26	31S	22E
	Standard Oil Co.		18	26	12N	24W
Sunset	Bargol Oil Co., Ltd.	Bargol	2	11	27S	27E
Poso Creek	Vanguard Oil Co.	Baker	7	33	27S	28E
Mount Poso	Honolulu Oil Corp.		87	18	28S	29E
Round Mountain	Mohawk Petroleum Co.	Hood	9	30	30S	29E
Mountain View	Oils Inc., of Calif.	Seven Spot	2	13	28S	27E
Kern River	Union Oil Co.	Del Rey	8	11	28S	27E
Kettleman North	Petroleum Securities Co.	Felix	4	35	21S	17E
	Kenda		67	20	21S	17E
ABANDON						
Santa Fe Springs	McVicar-Rood	Wilshire-Peterson	1-A	6	3S	11W
Long Beach	Alfred D. Mitchell	Plymouth	3	29	4S	12W
Coyote Hills	Standard Oil Co.	Murphy-Coyote	30	18	3S	10W
Playa del Rey	Bush & Webb		1	28	2S	15W
Los Angeles City	Harris Rogalske		1	..	..	..
L. A. County	West American Oil Co.	Domingues Estate	1	5	4S	13W
El Segundo	Richfield Oil Corp.	Santa Fe	1	18	3S	14W
Newhall	Holbrook Petroleum Corp.	Broughton	1	28	4N	16W
Mount Poso	Hugh L. Mann	Mann	2	27	26S	28E
Midway	C. C. M. O. Co.		11	1	32S	22E
Sunset	The Hancock Oil Co.	Maricopa	3	8	11N	23W
Elk Hills	Richfield Oil Corp.	Crampton	11-D & 3-H	1	31S	24E
		Crampton	18-A	6	31S	25E
Mountain View	Mohawk Petroleum Co.	Hood	4	30	30S	29E
	Hogan Petroleum Co.	Wharton	9	32	30S	29E
Kern County	Seeco Petroleum Corp.	Armstrong	1	9	26S	26E
Colusa County	D & M Oil Co.		1	21	14N	5W
Kings County	Dudley Dome Oil & Gas Co.		1 & 2	9	13S	20E

Summary	Past Two Weeks	Preceding Two Weeks	This Year To Date	Last Year To Date
Total New Wells	76	64	1324	903
Total Deepened or Redrilled	32	36	574	666
Total Abandoned	20	21	433	380

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LAUGH THIS OFF

The only man we ever knew who really liked to hear the alarm clock go off in the morning was working on graveyard tour.

And as **Ray Pierson** always said, an alarm clock is all right if you like that sort of ting.

Jim Hill, the impressario of the shot gun, tells about a turkey shoot that took place out at Brea some time ago, at which the committee in charge of the affair displayed the following notice: "Shooting will begin at 9 a.m., and will continue so long as there is anybody left to shoot."

On the other hand, **Ed Leabow** knows a golf widow who has just ordered some mourning paper with a green border.

And we can't help admiring the safety-conscious individual who, when he went in to ask the boss for a raise, first put on his safety helmet.

Ike Burroughs now claims that the United States has the finest navy in the world—both chewing and smoking.

"Mac" McLeod tells us that things are getting pretty lively up in the Valley. They had an eclipse of the sun up there just last summer.

Although business is good generally, however, one of his best friends had to sell his car recently because he couldn't keep on buying it any more.

Now comes **Guy Tate** declaring on his word of honor that a contemporary publication carried the following announcement last week: "Owing to lack of space several births and deaths will have to be postponed until next week."

And **Bill Butler** says the birthstone of all field men is the grindstone.

While **Jim Reed** swears he overhead this conversation in a doghouse not a hundred miles from Santa Fe Springs:

1st Rousty: "Are you related to Bill Jones?"

2nd Rousty: "I am Bill Jones."

1st Rousty: "Well, that explains the resemblance."

Then there was the tough superintendent who was approached by a sympathetic employee. Says the latter, "Don't fire Edgar. Give him another chance. Wait till he does it again." "Yeah!" roared the supe, "but what if he never does it again?"

Bee Burgess, the La Habra rancher, has a neighbor who recently hatched out some chickens in an incubator, and is now going around telling all his friends that they look just like real ones.

Bee, incidentally, has always contended that a genuine friend is a bird who knows all about you, and still likes you.

And the wife of a local driller has been raising Cain with her old man for gambling ever since she found out that he bought a stack of Saratoga chips.

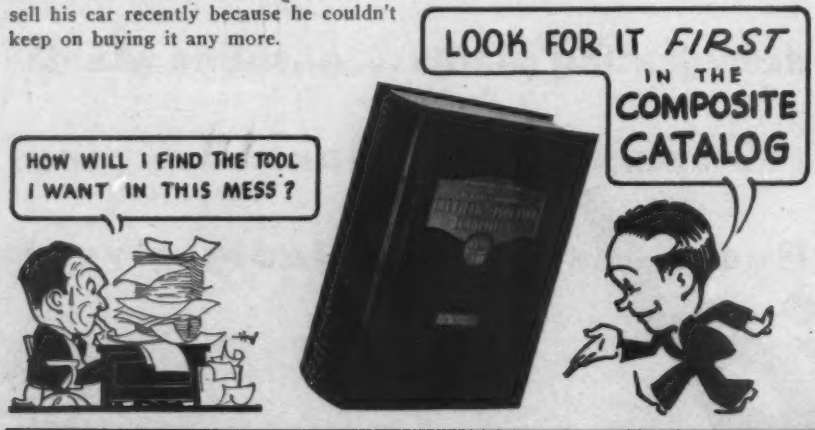
Frank Coyle, that well known coiner of epigrams, has just released a new one that contains a lot of wisdom: "All work and no play makes Jack a pipe line superintendent."

Red Wilson says, and doesn't blush while he's doing it, that he's getting along swell with his golf. The kids are allowed to watch him now.

And did we ever tell you about the golfer who took a trip to Grand Canyon, stood on the rim gazing at the majesty of the scene for fully five minutes, apparently enthralled, and then exploded, "Gee, what a place to tee off!"

A young oil man, whose name shall remain a deep and dark secret, left his job some time ago to pursue a literary career. We have just heard from **Joe Scanlon** to the effect that he hasn't caught up with it yet.

And this sort of insanity is due to some sort of swelling of the jocular vein.—R. S.



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COMPOSITE CATALOG.

12th Annual Fall Meeting

CALIF. NATURAL GASOLINE ASSN.

AMBASSADOR HOTEL
LOS ANGELES

November 16th, 1937

PROGRAM

CHAIRMAN: H. R. Linhoff

MORNING SESSION

9:30 — MEETING CALLED TO ORDER

OPENING REMARKS, J. C. Burks, President

10:00 - 12:00 — REPORT - - Technical Committee
Introduction C. D. Gard, Chairman

PAPERS

"Metering of Gasoline by Positive Displacement", T. R. Beauchamp

"Truck Gauging," Warren Kraft

"Physical Constants," D. A. Smith

"Liquefied Gas," C. L. McCartney

12:00 Noon — CLOSING REMARKS, J. C. Burks, President

CHAIRMAN: Wm. Moeller, Jr.

AFTERNOON SESSION

2:00 p. m. — OPENING REMARKS, Wm. Moeller, Jr., Chairman

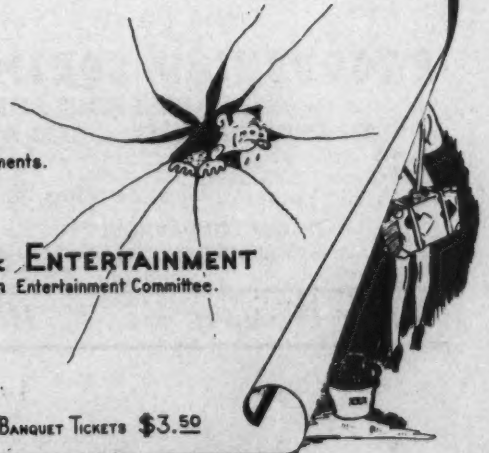
2:00 - 3:30 — ADDRESS - "A Discussion of Present Trends and Future Prospects of the Natural Gas Industry in California," - Dr. Lester C. Uren, Professor of Petroleum Engineering, University of California

3:30 - 5:00 — "Polymerization," Henry N. Wade, President Parkhill-Wade, Inc.

- DISCUSSION -
E. G. Ragatz, Union Oil Company of Calif.
W. N. Roper, Western States Gasoline Corp.

CLUB ROOM FEATURES

5:00 - 7:00 — Music and Refreshments.



7:00 p.m. — **BANQUET & ENTERTAINMENT**
Jim Reed, Chairman Entertainment Committee.

PRICE OF BANQUET TICKETS $3.50

C. N. G. A. Meeting Set For Nov. 16 At Ambassador

Six technical papers, entertainment and annual banquet scheduled for all-day session.

With over 750 expected to attend, officials and committee heads of the C.N.G.A. are busy making plans for the annual meeting of the organization set for Nov. 16 at the Ambassador Hotel in Los Angeles. Arrangements for the convention are under the chairmanship of B. Douglass Balthis, program chairman of the group and vice president of Natural Gas Equipment, Inc.

As plans assume their final form, with six technical papers, a luncheon, and a banquet on the program, Balthis urges all who are able to attend the meeting to do so. "This year," he said, "we have one of the finest set-ups we have ever had for our fall gathering, and the program will certainly add greatly to the knowledge and understanding of certain phases of the natural gasoline industry. In addition, the meeting offers an unparalleled opportunity to exchange views with other members of the industry, and entertainment features are outstanding."

Four technical papers will be presented at the morning session, scheduled to begin at 9:30 p.m. These are:

"Metering Gasoline by Positive Displacement Methods," by T. R. Beauchamp of The Texas Co.

"Truck Gauging," by Warren Kraft of Honolulu Oil Corp.

"Physical Constants," by D. A. Smith of Tidewater-Associated Oil Co.

"Liquefied Gas," by C. L. McCartney of Petrolane Corp.

Adjourning for lunch, members will re-convene at 2 p.m. for the featured speech of the day, to be presented by Lester C. Uren, professor of petroleum engineering at the University of California. Dr. Uren, an outstanding contributor to the field, will present "A Discussion of Present Trends and Future Prospects of the Natural Gas Industry in California."

The last paper of the day will be presented by Henry Wade, of the Parkhill-Wade Co., and the Stearns-Roger Manufacturing Co. of Denver, who will speak on "Polymerization." This topic, one of paramount interest to C.N.G.A. members, will receive a particularly thorough treatment at the meeting, as Wade has spent much of the past year in the construction of plants for the process, and in the study of the subject generally.

With dinner scheduled for 7 p.m., the period between the close of the afternoon session and the banquet will be given over to informal discussion of topics of mutual interest and the renewing of acquaintances. The dinner, to be served in the Fiesta Room, will be followed by a floor show, under the direction of Patrick and Marsh.

The technical sessions will have as their chairman, Clare Gard of Union Oil Co., and J. C. Burks, of O. C Field Gasoline Corp. will preside at the banquet.

New Chain Store Bill Would Affect Oil Industry

Provisions of his new chain store bill were outlined by Representative Wright Patman before the annual convention of the National Association of Independent Tire Dealers, Inc., at Chicago, Oct. 19. The provisions are: (1) To supplement the Clayton Act against unlawful restraints and monopolies by inserting a new provision in the law which would make it unlawful for any corporation to own retail outlets in any other state except the state in which it is incorporated. (2) The word "retailing" means the sale and distribution at retail of any articles or materials. Also that such corporation shall not in any way or manner, directly or indirectly, be interested in retail distribution outlets in any other state or have any direct or indirect control of retail distribution outlets in any other state or control of stock or other capital, evidences of debt or physical properties or equipment or other assets through control, lease, or agency arrangements through interlocking directorates or officers or through any other means or circumstances.

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Treatment Of Gases To Remove S, CO_2, and H_2S

By Guy Corfield, Research Engineer
Southern California Gas Company

Paper given before Taft Division of C.N.G.A. October 21, 1937

There are a great many gases encountered in industry which require purification and to which the above title might apply, but in this paper I am confining my remarks to the consideration of stripped natural gases, and refinery gas from cracking stills and stabilizers, as it is these gases that you will encounter the most and in which you will be most interested.

Composition of Gases

The composition of natural gases varies widely throughout the world and, for that matter, throughout the state of California. They are composed largely of the simple hydrocarbons, methane and ethane, with small amounts of higher constituents and varying amounts of carbon dioxide and nitrogen. They also contain widely varying amounts of sulphur and, to the speaker's knowledge, this sulphur is almost invariably present as hydrogen sulphide; the mercaptans and other organic sulphur compounds, if present in the raw natural gas, remain with the gasoline and are not discharged with the stripped gas leaving the absorption plants. The same is true of refinery gas from cracking stills and stabilizers. This paper then will consider that the sulphur problem in gas is confined to the removal of hydrogen sulphide. Hydrogen sulphide appears in widely varying concentrations throughout different parts of the United States, as shown in the following table.

Hydrogen Sulphide Content of Gas in Various Fields

State	Per Cent by Volume	Grains Per Cubic Feet
Illinois (4)	0.02— 1.26	12.6— 794
New Mexico (4)	0.81— 5.05	510 — 3182
Texas (4)	0.00—20.50	0.00—12915
California (5) (6)	0.00— 0.43	0.00— 270

You will note that in the Texas fields it varies from 0.00% to 20.5%, while in California it varies from 0.00% to 0.43%. While the quantities of hydrogen sulphide are more readily visualized if expressed as percentage by volume, they are ordinarily spoken of in terms of grains per 100 cubic feet, and the corresponding values expressed in this manner are also shown in the table. Carbon dioxide also varies widely in different areas; in California there are certain wells, in the Ventura field for instance, where it is entirely absent, whereas in the vicinity of Taft and Bakersfield it may run as high as 15%, and in a few wells in Imperial Valley it is the major constituent.

Reason for Removal

Carbon dioxide is not ordinarily and deliberately removed. While some investigators believe it is a factor in the internal corrosion of high pressure gas transmission lines, it is not generally considered a very active constituent from this standpoint, nor does it interfere with combustion to a degree where the expense of removal would be justified. It is removed, however, in some instances where it occurs as a major constituent and is used to make solid carbon dioxide or "dry ice"; and in Colorado, where a helium plant is operated, the gas is purified with respect to carbon dioxide, because its presence would interfere with the helium refining process.

Hydrogen sulphide, on the other hand, is a very active corrosive agent and its removal is highly desirable and often absolutely necessary. Particularly in the presence of liquid water and air or oxygen it attacks the interior of pipe lines violently to cause pitting and general corrosion, which not only weakens the pipe walls but generates scale and dust, consisting largely of iron oxide. These corrosion products, either adhering to the pipe walls as scale or becoming loosened and being transported with the gas as dust, create serious operating difficulties. The scale increases the friction of the gas against the pipe walls and therefore reduces flow capacity. The dust accumulates in low spots, bends, etc., and also reduces flow capacity by reduction of effective area. The dust is also transported by the gas and causes great havoc to regulators and to the pistons and cylinder walls of gas compressors and other machinery. Finally, when and if the dust is carried through into the distribution system of the gas utilities, it causes considerable difficulty not only with the regulators and meters in the utility system, but also in the stoppage of orifices and contamination of thermostats and other regulatory devices of gas burning equipment. Again, if the transmission pipe line escapes attack by the hydrogen sulphide because of the absence of liquid water or oxygen, this hydrogen sulphide will arrive in the utility distribution system in its original form and readily attack copper tubing and brass orifices and fittings in domestic appliances, particularly if in zones of heat, with the formation of black copper sulphide, which builds up to eventually block the tubing or orifice. Finally, if the hydrogen sulphide passes through the domestic appliance and burns, it may make an objectionable odor if present in large enough quantities; or if it escapes into the room unburned, it will be objectionable because of its odor, because it is poisonous even in small quantities, and because it very rapidly tarnishes silverware.

The California State Railroad Commission has ruled that gas distributed for domestic purposes must be free from hydrogen sulphide when tested by the conventional lead acetate test. This is equivalent to a concentration of hydrogen sulphide not above 0.3 grains per 100 cubic feet. This concentration of hydrogen sulphide at the low pressures that are in effect in the average domestic gas distribution system, in the range of two or three atmospheres, is apparently low enough to avoid noticeable corrosion, and also to avoid difficulties with copper tubing and brass fittings in appliances as already discussed. This is borne out by the operations of the Southern Counties Gas Co. in the Venice area where purification of the gas down to 0.3 grains per 100 cubic feet is satisfactory, but where break-down of the purifying equipment to permit a higher concentration results in immediate field complaints. In the case of high pressure transmission gas lines, however, 0.3 grains per 100 cubic feet of hydrogen sulphide becomes actively corrosive in the pressence of liquid water and/or air or oxygen. This can be understood when it is realized that a gas main under 400 pounds gauge pressure, or approximately 28 atmospheres, would contain 28 times as many hydrogen sulphide molecules per unit volume of gas or per unit area of pipe wall, than would be the case if it were operating at 0 pounds gauge pressure. In other words, a molecule of hydrogen sulphide in the high pressure line would have 28 times as great an opportunity of coming in contact with the pipe wall. This theoretical ratio does not hold in practice, apparently, as it is found that 0.1 grains of hydrogen sulphide per 100 cubic feet does not cause an unreasonable amount of corrosion in the gas line operating at 400 pounds pressure, particularly if the water vapor content of the gas is controlled so that liquid water condensation seldom occurs, and if the oil field gathering lines and gasoline storage tanks are properly maintained so that

air is not introduced into the gas. The corrosiveness of hydrogen sulphide is intimately associated with the simultaneous occurence of liquid water and oxygen in the gas line, and if water condensation can be eliminated and the oxygen controlled to a reasonable operating minimum, the hydrogen sulphide tolerances could no doubt be raised. Under the present methods of operating high pressure gas transmission lines in California, it appears that the hydrogen sulphide concentration to give reasonable troublefree operation should not exceed 0.1 grain per 100 cubic feet. Fortunately the bulk of the gas produced in California contains hydrogen sulphide below this concentration, the most outstanding exception being the Venice field already mentioned.

It is desirable to remove hydrogen sulphide from refinery gases that are to be put through a polymerization process, as the sulphur would otherwise appear in the gasoline. A further reason for removal of hydrogen sulphide would be because of its extremely poisonous action on animal life, it being rated as more toxic than carbon monoxide, and great care must be taken in handling it so as to avoid danger to plant operators. In some methods of removal, to be described later, the hydrogen sulphide can be recovered in a concentrated state and used for sulphuric acid manufacture, or can be converted to finely divided elementary sulphur which is quite valuable as an insecticide; under certain conditions the value of such by-products might be justification for its removal.

Methods of Removal

In general, all the methods for removing hydrogen sulphide from gas, except the iron oxide method, also remove all or part of any carbon dioxide that may be present in the gas. When, as in most cases, it is not necessary or desired to remove the carbon dioxide, these methods are often unsatisfactory; the carbon dioxide in some cases weakens or deteriorates the chemical solution; often the carbon dioxide in the gas is at a higher percentage than the hydrogen sulphide to be removed, and hinders or prevents its removal. The natural gas industry has need, therefore, of a satisfactory liquid purification process which will selectively remove hydrogen sulphide. Refinery and stabilizer gases do not contain carbon dioxide.

Carbon Dioxide

When it is desired to remove carbon dioxide it can be taken out by several methods as follows:

1. Girdler Process. This process will be described later.
2. Seaboard Process, which will also be described later.
3. Lime Process, by passage through beds of quicklime.
4. Scrubbing by sodium hydroxide.

As already discussed, the removal of carbon dioxide is not ordinarily desired or deliberately undertaken, and detail methods are of no particular concern to the natural gas or oil refining industry.

Hydrogen Sulphide

1. Liquid Methods. In the liquid methods of purification the gas is scrubbed by being passed up through a tower, down which a chemical solution passes over suitable baffles or other interior arrangement to obtain intimate contact. The chemical solution is then pumped to a second scrubbing tower or other appropriate container, where it is revivified by the use of air or steam so that the hydrogen sulphide is removed and solution can be returned to the gas scrubbing tower. In this way the original solution can be used over and over again with only enough make-up to compensate for chemical losses, or for any portion that is permanently changed and rendered inactive by some other constituent in the gas. A typical liquid purification plant is quite economical with respect to land space, as the scrubbing towers are in a vertical position and auxiliary equipment of pumps and steam boilers, etc., are not bulky. The equipment is relatively small in cross section and therefore can be built to operate at high pressure at reasonable cost. The gas pressure drop through such equipment is very low. For these reasons liquid purification methods are resorted to whenever possible. The following methods are those ordinarily considered:

(a) Seaboard Process. This process uses a solution of soda ash (sodium carbonate), which is revivified by blowing through the solution large quantities of air, which air removes the hydrogen sulphide and regenerates the solution. This regeneration process is done in a contact tower similar to a gas scrubbing tower. The air carrying the hydrogen sulphide may be discharged to the atmosphere, if such procedure will not cause undesirable polution of the atmosphere in the immediate vicinity, or can be used for combustion air so that the hydogen sulphide is burned, in which case it will be converted to sulphur dioxide and discharged to the air in this form. Usually hydrogen sulphide is very objectionable if discharged into the air in the raw state, and will not be permitted by any community. Sulphur dioxide is not so objectionable, and may be tolerated, at least in an industrial district.

(b) (1) Ferrox Process. The solution in this case is soda ash, carrying an iron compound in suspension.

(2) Nickel Process. The solution is soda ash with a suspended nickel catalyst.

(3) Thylox Process. In this case the solution of soda ash contains arsenic trioxide.

When gas containing hydrogen sulphide is brought in contact with any of the above solutions in a contact tower the hydrogen sulphide is absorbed, but in a manner requiring more intimate contact with air for revivification than is the case in the Seaboard process where air is merely passed through a second contact tower. In these three cases the air must actually be bubbled or forced into the solution. This is done by forcing the air through cloth tubes in the bottom of suitable tanks; or by whipping the air into the solution with rotary paddles; or by bubbling compressed air in at the bottom of a tall small diameter tower holding the solution. The latter process is the most economical on air, and also requires the least ground space. In the above three processes the hydrogen sulphide is oxidized to finely divided elementary sulphur, which is very valuable as an insecticide, such as is used for spraying citrus orchards, and has a high commercial value. The sulphur from the Thylox process is particularly pure and can be marketed as brimstone.

(c) (1) Girdler Process. This process utilizes an organic chemical solution of 50% triethanolamine in water, as the absorbing medium. This solution releases the hydrogen sulphide, if heated to 212° F. in a suitable tower through which low pressure steam is passed, and is thus regenerated and can be used again. Carbon dioxide is also absorbed and released in a similar manner. In the case of refinery gases or natural gas not containing carbon dioxide, the released hydrogen sulphide will be in a very pure and concentrated form.

(2) Phenolate Process. This process employs a solution of caustic soda and crude phenol. After the gas has been scrubbed to remove hydrogen sulphide the solution is, as in the Girdler process, revivified with steam, with discharge of hydrogen sulphide which, under conditions of carbon dioxide free gas, can

also produce very pure concentrated hydrogen sulphide.

(3) Lime in Salt Solution Process. This process employs a solution of lime (calcium hydroxide) in sodium chloride solution, which solution is used to scrub the gas in a conventional contact tower and then, when treated with steam, releases the hydrogen sulphide. Carbon dioxide in the gas seriously interferes with the process by converting the lime to calcium carbonate and rendering it inactive.

In these three processes the hydrogen sulphide can be discharged into the air, or burned and discharged as sulphur dioxide (subject to the considerations already stated) or used to make sulphuric acid. Such acid usage is developed at the El Segundo plant of the Standard Oil Co. of California, and described in reference (3). All the above liquid processes are controlled by the Koppers Research Corp. of Pittsburgh, except the Girdler and the Lime in Salt Solution processes. In general, the liquid purification processes will not remove hydrogen sulphide down to the California State Railroad Commission tolerance of 0.3 grains per 100 cubic feet.

2. Dry Methods

(a) Lime. A dry method that was used in the old days of gas manufacture for the removal of hydrogen sulphide consisted of passing the gas through a bed of lime. Carbon dioxide, however, interferes with this process by rendering the lime inactive. It was also difficult to dispose of the lime after it was used up as it could not be revivified and had an objectionable odor.

(b) Iron Oxide. The second dry process, and by far the most important one, is by the use of iron oxide. Iron oxide in the presence of water will actively combine with hydrogen sulphide to form iron sulphide. This iron sulphide can be reconverted to iron oxide by contact with air or oxygen, with formation of free sulphur. After this revivification the iron oxide is again available for purification and the process of alternate gas purification and air revivification can be continued until so much free sulphur is formed that it interferes with the contact of the gas with the iron oxide. In practice the iron oxide is made by the action of iron sulphate with slaked lime to form iron hydroxide, which is precipitated on wood shavings and with brief contact with air turns into the oxide. This "oxide" purifying material is prepared by intimately mixing wood shavings with iron sulphate, water and slaked lime, and exposing the mass to the air. It is then put into the purifying box, which consists of any suitable container having one or more shelves or trays to support the porous mass of oxide so as to permit relatively free passage of the gas. Hydrogen sulphide is removed as the gas passes through, and if the initial concentration of hydrogen sulphide is reasonably low, purification down to 0.3 grains per 100 cubic feet is possible with equipment of reasonable size. It is conventional to have two or more oxide boxes so that one can be used for purification while the other is being revivified. Revivification can be done in place, by pumping air through the box, being careful to do this rather slowly as the oxidation of iron sulphide to iron oxide evolves considerable heat and there is the danger of spontaneous combustion. The alternate absorption and revivification can be continued in practice, until there is approximately 50% free sulphur in the oxide mass, at which time the contact efficiency is materially reduced and the material is rejected. Carbon dioxide is not absorbed in this process. Inasmuch as the oxide boxes are relatively large they would be very expensive if made to handle large quantities of gas at high pressures. The process is particularly adapted to purification of gas for domestic purposes where the initial hydrogen sulphide content is in the order of 100 grains per 100 cubic feet or less, the pressures low, the volumes relatively small, and where the gas contains carbon dioxide. It would also be applicable to the final and complete purification of high sulphur gas that had been given preliminary treatment by a liquid process. A successful installation is being operated by the Union Oil Company of California in the Venice field, where gas is being sold to the Southern Counties Gas Company of California for domestic distribution.

Conclusion

A great many factors must be considered when deciding which, if any, of these processes should be adopted for the particular set of conditions presented. Some of the controlling factors are the amount of hydrogen sulphide in the gas, the desired completeness of removal, the means of disposal of the hydrogen sulphide generated in the revivification process, the amount of carbon dioxide in the gas, the original and maintenance costs of chemicals, the pressure of the gas as it controls the construction of equipment to withstand such pressure, the available land space, etc. Sometimes a large quantity of hydrogen sulphide in the raw gas may be an advantage in that the values of the by-products, either as sulphur or hydrogen sulphide, may be credited to the cost of removal. On the other hand, with initial high concentration of hydrogen sulphide in the gas complete, or substantially complete removal is economically impossible with a single process.

Each gas purification job presents its own special problems, and should be worked out very carefully in advance. Consideration should be given not only to the conditions and requirements as presented, but to possible future developments. As already intimated, the known processes are not entirely satisfactory under all conditions; and it is not improbable that there will be more exacting requirements in the future. With the development of new refinery processes such as polymerization, sulphur may become increasingly objectionable; if transmission pipe lines are operated at higher pressures more purification may be necessary; and as oil production is developed in deeper wells more "impurities" may be encountered. It therefore appears that there is ample scope for the skill and ingenuity of our chemists and engineers.

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Union Reports Profit Of $8,850,000

Union Oil Co. reports profit of $8,850,000 for the first nine months of 1937, compared with $4,400,000 during the like period of 1936. On a per share basis, profit for 1937 is $1.90, against $1 for the 1936 period, with higher provision for depletion and depreciation during 1937 accounting for the discrepancy. Sales were 28,300,000 bbls. against 22,900,000 during 1936, the 1937 increase being 5,400,000 bbls.

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Medearis Opens New Headquarters

Above is the South Gate headquarters of the Medearis Oil Well Supply Co. To the left are Paul Medearis, left, and Harry Taylor, principals in the company.

Medearis Oil Well Supply Co. has opened its new headquarters at 8638 Otis St., South Gate, with complete stocks of Patterson-Ballagh casing protectors, wire line guides, stabilizers, and swivel bumpers; Link-Belt mud screens; perforated casing; Kerrick-Kleaner, hydro-steam; Jeffrey rotary chain; Rex-Chabelco chain; reconditioned chain; Ecolite lanterns; Edwards wire rope; Trojan steam turbines; Security cat lines and rope, and other equipment items.

In addition to the company's headquarters, it also maintains stocks and warehouse facilities at Avenal, Santa Maria, Bakersfield, and Ventura.

Camroo Abandons Puente Hills Wildcat

The Camroo Oil Co., a McVicar & Rood affiliate, has abandoned Stern No. 1, a wildcat in sec. 33, 1-9, Puente Hills district. The Miocene brown shales were penetrated to a depth of 2685 ft. but no showings worthy of testing were encountered.